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[OFFICIAL NOTICE.]

November Meeting, Guild of Gas Managers.

OFFICE OF THE SECRETARY, October 25th, 1895.

The November meeting of the Guild of Gas Managers will be held in Young's Hotel, Boston, Mass., at noon, of Saturday, the 9th prox.

A. K. QUINN, Secretary.

[OFFICIAL NOTICE.]

November Meeting, Society of Gas Lighting.

OFFICE OF THE SECRETARY, October 25th, 1895.

The November meeting of the Society of Gas Lighting will be held in the works of the Mutual Gas Light Company, New York City, at 3 P.M. of Thursday, the 14th prox. FRED. S. BENSON, Secretary.

BRIEFLY TOLD.

THE LAST DAY OF THE MEETING.—Continuing from the point at which our Philadelphia correspondent closed his references last week to the Quaker City gathering of the American Gas Light Association, it is our privilege to say that the trip to South Jersey's far-famed pleasure resort—Atlantic City—which was the outing planned for the entertainment of the Association by the local Committee of Arrangements for the final day of the convention, was thoroughly enjoyed. Perhaps 250 members and guests shared in the well-arranged programme, and all agreed when the day was at an end that the Committee had provided wisely and well. Albeit the air was a trifle sharp, even to the degree of suggesting that Indian summer's sun was about to abdicate his mellow reign, bright skies and dancing blue waters, white-capped and restlessly rolling and turbulently breaking over and upon the shimmering sands of the glorious Atlantic beach, so moved the vital forces of the visitors that sharp breezes were forgotten in the general glory of it all. At noon the party arrived, and were greeted by the Hon. F. P. Stoy and other representative citizens of Atlantic. By this time the guests were alive to the next number on the programme, which was the absorbing of an excellent dinner served at the Hotel Rudolph—the house had been especially opened by the proprietor to cater to the Association for its brief visit. The repast ended, a journey was made to the lighthouse at the eastern end of the city, the beacon flame from which has often served in the depth of night to point the way to the huge colliers, gas coal laden, that steal their way along the coast to serve the eastern gas man with the 5-feet-to-the-pound material wrested from the near Southern mines. Major Wolf extended the hospitalities of the "House" to the visitors, one of whom rather spiritually remarked that the external appearance of Atlantic's "Light" reminded him of the type of bottle in which the glories of Liebfrauenmilch are confined. Next in order was a visit to the life saving station, where the sturdy patrollers of the beach gave an excellent exhibition drill. A visit to the Ocean Pier and a stroll along the famous board walk occupied the attention of the visitors, following which was a trolley ride to Longport, at the extreme western end of the city, then back to the depot of the West Jersey Railroad, thence to Philadelphia,

and the close of the Twenty-third annual convention. Nothing happened to mar the day's outing, which was cleverly arranged, thoroughly enjoyed and harmoniously ended.

AN ORIGINAL ADDRESS, A QUEER OMISSION, AND A LESSON.—Our correspondent, in his despatches last week from Philadelphia, remarked of President Clark's address, "It is quite characteristic of him, for he is a man of opinions, and is not only given to expressing them, but also knows how to express them." Nor have we to take any exception to that way of putting it, since that which was written is the exact truth. Still, we believe it cannot be controverted that the address was not in matter of the sort to which the majority—the great majority—of the members were looking forward to. All must admit that Mr. Clark, from his position of Chief Engineer to the largest corporation of its kind in America, the United Gas Improvement Company, had great opportunity to feel, and so know, how beat the pulse of the gas industry of the country, in respect of its actual standing to-day; but one may look in vain through its paragraphs for even a hint of the great gains that are making in 1895 as against the backsets of the dull days of 1893–4. Likely, however, he took it for granted that, as the good news was about the property of all just now, that which everyone knew was hardly worth repeating. The tone and tenor of his paper, in fact, are strictly institutionary, in that they point towards causing the American Gas Light Association to take on the policy of an institution rather than of an association. In this course of suggestion we are inclined to the view that Mr. Clark errs, not so much that his reasons therefor are not sound and earnest and honest, but that he is too far ahead of the trend of thought in the gas business of to-day in their presentation. A fair trial, for instance, has been given in the direction suggested by Mr. Clark, in respect of the Association's *Quarterly*. Good work has been devoted to it, and a good book has been the result; but the apathy of the Association towards it has doomed it. It was not sufficiently in touch with either the members of the Association or the gas men who were not of the latter; and all, or largely, because of the stern fact that what happens to-day is not necessarily the basis of the sentiment of to-morrow. We all, however, must agree with Mr. Clark that "special committee work" can be made to lay deeply its impress on the institutional work of the Association; for there is no other thing on its records graved lower than the findings of its committee on the standardizing of meter unions. Truthfully does Mr. Clark say that "Self-interest is the important factor in the work of the world;" and to that we would add that the self-interest of the American Association lies in simple beginnings with practical results, rather than in reaching out now for that which *might* be attainable on the other side of 1900. That Mr. Clark spoke manfully the hope and the belief that are within him is undeniable. The "queer omission" to which we would call attention is afforded in the neglect, or failure in any event, of the Association to name a committee on memorials. Unhappily, this year the necrology roll was of exceeding sad length, and on its dark roster rested the names of many who were practically known to and loved by us all. It is, of course, an omission that may be easily corrected, but the respect that tempers grief is best shown and most valued when its ministrations are soonest manifested. The lesson to be studied, as a result of the American's meeting, is the very old one that attention to detail is worth the practicing, even though the detail seems wearisome, slow and unprofitable.

MR. JONES' REMARKS ON CALCIC CARBIDE.—At the meeting of the Pacific Coast Gas Association, held in San Francisco last July, Mr. E. C. Jones, of the San Francisco Gas Light Company, had something to say about calcic carbide, and his presentation of the subject was misunderstood by a contemporary to the point of causing the latter to utter some slurring comment thereon. Of course, Mr. Jones requires no defence at our hands, for that clever Easterner, whose practical gas education was acquired in the South Boston Gas Light Company's service, can always be depended upon to know where and how he is. We might say, however, that his speech before the Association on calcic carbide was culled offhand from a lecture which had been delivered by him before the Academy of Sciences some time prior to the Association meeting, and to a mixed audience, less technical than otherwise, wherefore the lecture was more in a popular strain and somewhat lengthy. As time was short at the Pacific Coast meeting, when Mr. Jones was called upon, rather than interrupt the balance of the programme, he gave only a few items from the lecture previously delivered before the Academy of Sciences.

MR. PAUL A. DOTY has resigned from the service of the Paterson (N. J.) Gas Light Company, which corporation he served faithfully and well since 1888. The resignation takes effect December 1st, 1895.

[Continued from page 654.]

ABSTRACT OF PROCEEDINGS, TWENTY-THIRD ANNUAL MEETING OF THE AMERICAN GAS LIGHT ASSOCIATION.

HELD AT CONTINENTAL HOTEL, PHILA., PA., OCT. 16, 17 AND 18, 1895.

FIRST DAY—MORNING SESSION.

Mr. W. H. Rogers, of Paterson, N. J., not being present when called upon by the President to read his paper on

THE CREATION OF A HEALTHY PUBLIC SENTIMENT TOWARD THE GAS COMPANY IN THE LOCALITY IN WHICH IT OPERATES,

Secretary Slater read it, as follows:

By "A healthy public sentiment toward the gas company," I understand such a sentiment or feeling as would be developed by the belief, in the minds of the individuals who make up the public in our locality, that our company is honest and impartial, fair and square in its dealings with all consumers or patrons. That while we have rights which we expect shall not be violated, we are not forgetful or unmindful of the rights of others; that, while we look for and must have a fair profit, we are not unreasonable; that, while we are obliged to have rules, we are not tyrannical in their enforcement; that, while we are striving to extend and increase our business, we do not wish to do so by working injury to any other interest; that we are willing to give in every case a fair return, and that we do not want the big end of everything all the time. In fact, we desire to prove and have our public believe that our company is every bit as worthy of faith and confidence as is any other square, honest dealer, be his line groceries, dry goods or gas, who, being in business to stay and having a reputation to make and maintain, endeavors to increase his patronage and profits by selling good goods at fair prices and by telling the truth about his wares.

We will not dwell upon the oft told tale of woe in which, for present glorification, our predecessors have been made sometimes to figure as neglectful of consumers' complaints or overbearing toward those unluckily obliged to complain, and as thus causing to be visited upon us, in a later generation, the wages of their sins. We will not linger over the fascinating facts, so often previously proven, that nowadays we must have good gas, well distributed under uniform pressure, with candle power practically unvarying and measured by accurate meters. Nor will we more than mention that, in dealing with the public, the commercial department should never forget to speak well of the manufacturing department which makes and delivers our good gas to consumers. We will presume that we have our house in order, with shutters thrown back and front door open, and that under present methods our conscience, as regards the consumer, is void of offence. While waiting his appearance two or three thoughts suggest themselves:

1. Wherever we meet the consumer, at our office or elsewhere, every employee, from manager down, should learn and practice courtesy. As it would be the greatest discourtesy to express doubt of our fellowman's veracity, we should never, in any case, state or insinuate any doubt of a "kicker's" honesty of purpose. "High bills" give rise, doubtless, to our most troublesome class of complaints. I have come to the conviction that the great majority of those who complain of high bills do so not to worry us but because they really believe that they have a grievance. This belief is worthy of our respect. Hence, in discussing a complaint, even if we know that the kicker is wrong, not only should we refrain from impugning his motives, but, to my mind, an initial statement that we credit this belief will go far to mitigate the sting if we can prove him mistaken, or are obliged to decline to accept his views.

2. In dealing in general with the public, we have this to strengthen us that, while our company calls upon us to get and retain all possible business, it expects this to be done only by fair means. I would not, therefore, approve of adverse criticism or belittling comments regarding any competitors—gas, electric or oil—but would rather be frank in acknowledging their good points, not, of course, forgetting our own. We have against us at Paterson a strong and well managed electric light company, who sell current in some cases by meter. When this meter and its owners have been condemned in our office by someone who has turned to us on account of high and irregular electric light bills, we have more than once stated belief in the honest intentions of the electric company. When to this belief is joined pity for their inability to secure more accurate measurements, it may be "damning with faint praise," but I am sure it is more dignified and more to *our*

credit than calling them hard names. Nor would I give special prominence to any accident from the use of an oil lamp or gasoline stove. The public know of these things as well as we, and, if they are to be talked about, I would think it well to allow the consumer to at least open the discussion.

3. As no man can be infallible, let us, if we make a mistake, be prompt to acknowledge and correct it and endeavor to arrange to prevent its repetition.

Our dealings with the public, by which we hope to create a healthy sentiment toward our company, arise mainly from meetings with individuals either in our office or at other places. Let us first consider treatment of the public in our office. Local arrangements differ, as do local opinions of these arrangements. At Paterson many bills are paid by checks mailed and a few held back for collection at the plyer's point, but, and we think fortunately, at least one-half of our consumers bring or send their money to the office. Dividing this latter half into two classes: 1st, the good people who pay without protest and ask for nothing more than a few burners, or attention, at our convenience, to the working of a gas stove, or accept our explanation that the last month's bill was large because it covered 33 days' consumption or included 12 dark days; and, 2d, the "kickers," who complain more or less loudly about high bills or poor light, we find that the good, quiet people largely exceed the noisy kickers. In any large town it is well nigh impossible to have personal acquaintance with all of the first class or to have excuse for such acquaintance. We can only say "how d'y do," receipt their bills with a "thank you," and be on the alert to supply their little wants and to direct attention to gas stoves, Welsbach lights and our other appliances for improving mankind's physical, mental and moral condition. But the kickers! Ask the aged schoolmaster if he remembers best the very good boys, the mediocre or the troublesome spirits of his classes, and, while he may not recall the very good and the good, he is sure to have name and date for those whose turbulence imprinted upon his memory the fact of their existence. So we, at the company's outposts, *must* know the kickers. In forming public opinion, we should endeavor to treat them in a manner "wise as serpents and harmless as doves." This is the more needful as they are apt to be representative people who have the courage of their convictions and the ability to disseminate their opinions.

It may perhaps be interesting to quote a few instances from experience, samples of classes and mode of treatment in each case.

Mr. X., merchant, converted some time ago from electricity. At his first complaint of high bill, we would read meter again, and, if previous reading be in error, correct bill at once. If, however, and more likely, the second reading should develop no error and consumer be still unsatisfied, we would change and test meter. In case meter was "fast," make proper allowance, but if meter be correct, and Mr. X. 'doesn't care what the meter says," we would for a while have meter read daily and a postal card sent him showing each day's consumption —meanwhile advising economy but not pressing collection. The daily reading cannot but show registration approximately very closely to a calculation of consumption based upon number of jets and hours burning. We followed such a course a year ago and had to do it over again lately, but we have kept the gentleman in line and retained his business. It is troublesome, and your foreman and meter reader may call Mr. X. (and truthfully) "a blamed crank," but there is a pleasure in handling successfully such a case and bringing the objector to practically by his actions disavow his spoken objections. The gentleman mentioned, like all of our race, is only human in being pleased by the receipt of attention, even if his gas bill be not reduced. Some of us require such consideration to a greater extent than the average, but all of us appreciate occasional recognition of the fact that we are still alive and in this part of the country.

Mr. Y., another merchant, uses gas at his residence. During the summer, while the family were all away except a woman left in charge, the house bill, instead of decreasing, showed a marked increase. Now we could diagnose this case from the gentleman's own statement. The caretaker, a poor, little, lone, frightened woman, worrying through sleepless nights and in fear of her life, kept three or four gas jets lighted for company and protection. Fearful of reproof, she would not, when the bill came in, acknowledge the facts, and Mr. Y., having known her as a faithful and truthful servant, could not doubt her word. Neither would we, nor could we doubt the meter, especially after it had been changed and found to test correctly. So, while expressing regret that we were unable to find any cause for rebate, we were obliged to collect the amount called for by the bill. Mr. Y. acknowledged that we had at least seemed to try to be fair, and that possibly the cause for the trouble had been in his household. A contributor to the Lawrence *American*, some time ago described in rhyme a case of this kind, as follows:

"*Two Sides to it.*"

"How sweet to roam by the sad sea waves,
While no cares your mind harass,
And what joy to think, as you watch the stars,
That you're paying no bill for gas!
But, oh! what grief when you travel home
And the meters your sad eyes meet!
You find that the cook has been holding soirees
And has burned 10,000,000 feet."

Mr. Z., on being refused discount after the 10th, began looking for the manager and fight. He expressed strong disapproval of our tyrannical and monopolistic mode of doing business. But it takes two to make a quarrel, and, after an explanation of our necessity for rules, and, for this time only, an allowance of the discount, he departed well smoothed out. He came back next day to apologize for what he by that time considered his rudeness of the first day, and has since been one of our best friends.

Mr. XY. neglected payment of his gas bills until a removal notice was sent him. He then came to our office looking for "a thing called Rogers." This was the chance of a lifetime for a beautiful scrimmage. Being, however, really a fair man, a little cool appeal to his business sense led to an amicable parting.

Mr. YY., also a wealthy business man of standing in the community, and prominent in one of our churches, pays promptly, seldom complains, and hence is one of the great and good majority who rarely come especially to notice. We reduced the price of gas October 1st, 1894, and, in mailing check for October gas bill, Mr. YY. expressed the opinion that, instead of reducing the price of gas, we had better improve its quality, which, at his house, had for some time been poor. This was our first intimation of his having been dissatisfied, and a letter was written stating this fact, thanking him for having mentioned it, stating that we felt sure of the good quality of our gas, and that his trouble must be entirely local. We also asked him to call at our office, or, if more convenient, to appoint an interview elsewhere. In a day or two he came to the office, and, after a pleasant talk, we concluded that the fault in his lights was from want of pressure due to clogging up of a rather old service pipe. We promised to remedy this by renewing the service. The interview gave opportunity to show and describe gas stoves and Welsbach lights, with sale of the latter. As soon after as possible the service was relaid, and the light, of course, became good. We believe the "healthy sentiment" has been developed in Mr. YY.'s mind, and that he is now, to some small extent, our missionary among his friends.

These have all been people well to do; but poorer folks deserve and should have as much and as careful attention. Mr. ZZ. keeps a small restaurant and pays us weekly. He works hard, and with the assistance of wife and family is trying to get on in the world. As he is kept awake until late every night and rises early in the morning, he is, when he calls to pay his little bill, apt to be crusty and fault-finding, and inclined to quit gas and use oil. His daily experience, with some who would sell him bad eggs for fresh, rank butter for gilt-edged, or cheat him regarding other food supplies on the one hand, and on the other with those who try to pay a twenty-five cent check with a dime, or try to forget to pay at all, makes him suspicious of all, even the gas company. But, by patience with his complaints, and attention when necessary, reading his meter every day for a while, and then teaching him to read it himself, and keeping him well supplied with burners and tips, we have kept him as a consumer and taught him to believe in us as far as the poor fellow is able to believe in anything or anyone mortal.

But as no man can please everybody, and some folks are best pleased in being displeased, we find sometimes a kicker who refuses to be reformed. For example, Mr. XYZ. is a learned and estimable gentleman, with a character in many respects lovely and lovable, but his monthly payments for gas are invariably accompanied by some caustic comment or expression of distrust. He has told us of his regret, through his residence out of the electric company's territory, and his wife's fear of kerosene, that he is obliged to use gas, and, in general, has, up to date, refused to be placated. He surely does us no good among his friends, and we have wished the electric light might get him, and so afford grounds for comparisons which could not be to our disfavor. But we do not give even him up, and if he and we live long enough, we will sometime find and improve an opportunity to show him that we are not as black as he has painted us.

In considering public sentiment, as our community consists not alone of men, we desire that their good opinion shall be supplemented by that

of the gentler sex. As regards household consumption the woman's opinion is in many cases the more important. With us, many house bills are paid by the ladies, and as most of them pay quietly, leave their orders without needless comment, and as has happened, a few sell each other stoves before our cashier's window, we often feel like quoting the old toast, "The ladies, God bless 'em."

Still, once in a while, a loud spoken, determined woman, finding ready gathered an audience of other consumers, will deliver an address calculated to freeze the marrow of the unhappy man behind the desk. Such cases are often more difficult to handle than when a man undertakes to find fault with us, and should have the manager's special care. I have in mind one woman, bright, keen, intelligent, educated, charitable to all the world but the gas company, who pays the gas bill for her household. She is the wife of a man who, having a large house, and receiving many evening callers, has, naturally, large gas bills. With these the lady is generally dissatisfied, and she knows how to voice her complaint. We have satisfied ourselves regarding the correctness of the registration, and I surmise that she agrees with us on that point. What she desires is to pay less money for light, and, as we cannot arrange this unless consumption were smaller, it seems to me that we can only make sure that the best service is rendered, and that this consumer is treated with especial attention and courtesy.

But let us turn to our experience outside of our office. Here almost invariably our business seems a more interesting topic for conversation than the other man's, and we must not weary of "talking shop." We must, without a murmur, listen to threadbare jokes about the meter or the bill that never agrees with consumption, and is a "g(h)astly substitute" for the truth; or, if one's name happens to be William, he is hailed as "Gas Bill." Still, if this pleases the joker, it doesn't hurt us, and the joker is apt to be tractable, should he become a kicker. It may seem a superfluous statement, but pleasant manners, practiced by the gas company's people, have no small effect in forming a healthful public sentiment. Especially is this so if to it be added the quiet assertion of our belief, not perhaps too pronounced, but always there, in the company's probity and fairness.

The company's representatives should be good citizens, taking part, as far as possible, in all matters of public interest or benefit. Perhaps politics should be excepted, but that is according to circumstances. You gas men are busy fellows, but, if asked to serve upon committees for the charity ball, the hospital fair, the Orphan Asylum supper, Fourth of July celebration, or reception of distinguished guests of the city, do it, and perform your share of the work in hand.

To sum up the whole matter, the gas company, though unendowed with mortal body, or immortal soul, must depend for continuous success upon the same rules of conduct as govern creatures having these attributes. Its policy should be the same as would be followed by any individual who could be said to have "the elements so mixed in him, that nature might stand up, and say to all the world this was a man." If, through its representative, in pushing its business, it practices integrity, fairness, and due regard for the opinions and rights of others, it cannot but succeed in creating and maintaining in its own locality, as regards itself, a kind and "Healthful public sentiment."

Discussion.

The President said that he was glad to see the Association interested in questions relating to the treatment of consumers; for the gas business had to do not alone with the making and distributing of gas, but also with its sale.

Mr. McMillin considered the subject treated in the paper as one of transcendent importance to the gas industry. Such rapid progress had been made in recent years in the reduction in price and increased output of gas that an important duty of the gas manager at the present time was the selling of gas. He mentioned some incidents in his own experience as a gas manager which illustrated the necessity of maintaining cordial relations with gas consumers. The proprietor of a newspaper in a small town thought he had been unjustly treated by the gas company, and began a systematic series of attacks in his paper upon it and its management. He invited all parties having grievances against the company to state them in his paper. This was immediately followed by a tirade of abuse. The general public became so interested in the subject that the Board of Trade took the matter up and invited Mr. McMillin to address them and the public upon the subject. This he did; and, judging from the demonstrations of approval which followed his remarks, the public was satisfied that they had been treated fairly and honestly by the gas company. The newspaper published his address, and admitted that most of the objections urged by consumers against the management had been satisfactorily answered; and the friendly attitude of the paper thereafter was worth thousands of dollars to that gas company. He believed a gas company should make just rules as to its treatment of consumers, and then adhere to them rigidly. He thought that most consumers who complained of their gas bills honestly thought that there was something wrong about them; and it was good policy sometimes to let the dissatisfied consumer feel that there was some degree of justice in his complaint.

Mr. Greenough agreed in the suggestion of Mr. Rogers that it was a good plan to secure men of high respectability to represent the gas company; and for the gas managers to take an active interest in local affairs. In his dealings with consumers the gas man should be able to control his temper in spite of all provocation. Every effort should be made to create a healthy public sentiment towards the company. Every consumer should be made to feel that he is getting his money's worth; that gas is sold to him at a reasonable price, and that he is getting what he pays for. In the larger cities it is better for the gas interest that there should be an official inspector of meters, to whom dissatisfied consumers can apply and have their meters tested. Mr. Greenough, in putting himself on record as favoring some system of profit sharing, said such system had been in operation in Cleveland for three years, and had also been adopted in Columbus, and was proposed for Detroit and Toledo. He believed that some plan of municipal profit sharing was the best antidote to the now common movement in the direction of municipal ownership; and in any such scheme it was far better for the gas company to take the initiative.

Mr. Searle believed that consumers had the right to demand kind and courteous treatment from the gas company at all times and under all circumstances, and he believed that such treatment would prove more conducive to the best interests of the company than any system of profit sharing. Increase of business, gained by the just and liberal treatment of consumers, made a better asset as a financial exhibit than an increase of plant.

Mr. Somerville said he had often heard the remark that the electric light had proved to be the best friend of the gas interest; that although it had brought competition, it had also in that way taught the gas man the necessity of being civil and obliging to his consumers; but he thought that the marvelous growth of the gas business, in spite of such competition, was due in part to the fact that it had always been the habit of gas companies to treat their patrons with consideration and politeness. He had always considered it the best policy to do everything he could to promote the interest and secure the satisfaction of his consumers.

Mr. Butterworth suggested that every gas man should be on the alert to make friends and to avoid making enemies, for a friend would often do as much good as an enemy could do harm. Every consumer should be treated with as much liberality as was consistent with the interests of the company.

Mr. McMillin agreed with Mr. Greenough in what he said about the advantage of some scheme of profit sharing. It often proved an advantage to a gas company to give the city a bonus, or some share in the profits made, in consideration of the granting of the franchise. He also advocated the sharing of profits with the workmen of the company. He had found it worked well in Columbus, where a dividend was paid to the employees at the same time and at the same rate as that declared to stockholders. This dividend was figured upon the amount of their wages for the preceding six months. This dividend, however, was not paid in cash, but in stock, until such time as the employee had acquired, by accumulation of dividends, or by purchase, $300 worth of stock.

Mr. Greenough said that in Cleveland the plan of profit sharing suggested was the payment into the city treasury of a percentage on receipts, and not a fixed sum as was done in Columbus.

Mr. Norris denounced any system of municipal profit sharing as being little short of commercial immorality. He saw no reason why a municipality had any more right to share in the proceeds of the gas business than it had to share in the profits of any other commercial undertaking. If the profits exceed a fair interest on the capital the consumers, and not the city, should get the benefit by a reduction in the charge for gas.

Mr. Forstall thought that Mr. Norris made a mistake in classing gas companies with other manufacturing interests, because the gas company was in the possession and profitable enjoyment of a franchise granted by the city; and it was no more than right that the gas company should make some return to the municipality for the granting of its franchise.

Mr. Harbison did not approve of Mr. McMillin's plan for sharing profits with employees, because it compelled them to take their dividends in stock. He preferred to pay dividends to employees in the

shape of an increase in wages; and believed that such a plan was more advantageous to the company, and more satisfactory to the workmen. Nor did he favor any scheme for giving the municipality a percentage of the earnings of the gas company, for the reason that there are a large number of consumers in every city who are not taxpayers, but who are none the less entitled to share in the profits, and the only way in which any return can be made to them is by a reduction in price. By such a reduction everybody is proportionately benefited. The gas company pays a larger proportion of local taxes than any other enterprise, or any individual; and in that way makes a sufficient return to the municipality for its grant of franchise.

Mr. Nettleton was inclined to favor some plan of municipal profit-sharing, for the reason that some return was due to the city not only for the grant of franchise, but also for the privilege accorded to the gas company of digging up the streets whenever necessary.

On motion of Mr. Neal a vote of thanks was given Mr. Rogers for his paper.

The Secretary then read invitations from the Franklin Institute, the Engineer's Club and the Manufacturer's Club, extending to the members of the Association the freedom of the Institute and Club rooms. The invitations having been accepted, the President introduced Mr. A. E. Forstall, of Newark, N. J., who read the following paper entitled,

RETORT HOUSE DESIGN AND PRACTICE.

This being a large subject, it seems wise to state in beginning that the proportion of the paper devoted to design will deal only with general suggestions as to a few points to be observed in the planning of a retort house and its appurtenances, and that the portion devoted to practice is not a treatise on all the known methods of doing retort house work with a selection and indication of the very best, but is merely an account of what is being done in one retort house, given without any claim that the work is being done better than in other places, in the hope that others will be induced to tell what they are doing under similar circumstances, and thus make common property of the knowledge heretofore belonging to separate individuals.

Starting from the foundations, the retort house should be built of sufficient width and height to admit of the use of charging and drawing machinery, even though there is no present intention of putting in such machinery. The louvre ought to be much larger than is usually designed, to allow a free and rapid exit for the smoke from poorly burnt charges, and the pungent fumes arising from the burning out of stopped standpipes. The provision of movable shutters on both sides of the louvre will greatly improve the ventilation, those to windward being closed, while those to leeward are open. It is also important not to have any openings in the roof near the eaves as such openings produce eddies of wind that are more apt to carry the smoke down to the floor than to take it up through the louvre. Of course the house will be designated for full depth regenerative benches, or at least for half depth regenerators, and with a view to future extension at a minimum cost.

The stack skeleton should be laid out with plenty of room inside the arches, to allow for wide furnaces and combustion chambers. For a bench of nine retorts, 10 feet 6 inches clear space inside the arch is not too much, while for a bench of six retorts at least 8 feet should be allowed. Width of furnace prevents the fire from burning so low during the interval between stokings as to interfere with the formation of carbonic oxide, and roomy combustion chambers are a *sine qua non* for the production of well distributed and high heats.

The formation of lampblack and naphthaline may be largely prevented by the adoption of such a size of retort, that the charge giving the desired yield at the heat to be regularly maintained will fill the retort as full as is consistent with convenience in charging the coal and drawing the coke. Large retorts, run at comparatively low heats, cause much more trouble than the same retorts at a higher heat with heavier charges.

Mouthpieces should be made the full size of the retort, without any taper towards the front, as otherwise the operation of drawing is rendered more difficult by the jamming of the coke in the narrower front opening.

Standpipes should be at least 7 inches in diameter, and great care should be taken to lay out easy curves for the bends. The time spent in determining the best combination of angles and curves, will be amply repaid by the freedom from stoppages that follows the ability to reach every point of the pipe with a proper cleaning tool.

Hydraulic mains should be large and fitted with some device to make the thorough cleaning out of heavy tar a matter of easy accomplishment without interfering in any way with the regular routine of gas making. The arrangement of separate main for each bench is best, but expensive, and many of the advantages of this arrangement can be obtained at slight expense by the use of cross partitions in the common main arranged to give each bench its own waterline. Each bench also has to have an adjustable overflow and a bottom outlet for running off tar.

Passing now to the second division of the subject, let us begin the description of the "practice" in the retort house under consideration with the first work necessary in a retort house, that of firing up the benches. In this case these are all fitted with generator furnaces, and provided with recuperators, that is, what are known as regenerative benches.

In firing up care is taken to prevent the formation of an explosive mixture of air and carbonic oxide in the furnace and bench while the heat is low, as the explosion of such a mixture by a sudden spurt of flame from the fire or the gradual heating up of its surface or the brickwork to incandescence, would be apt to damage the setting. All cracks in the brickwork are carefully plastered up, and all openings above the primary air ports kept tightly closed. If hot coke is used for filling the furnace, any quantity can be put in at once, but with cold coke a little at a time is the rule, always leaving a portion of the hot surface of the fire exposed, to ignite the carbonic oxide as soon as any air comes in contact with it before there is an opportunity for the formation of a mixture throughout the bench. This precaution is observed until the brickwork of the furnace and that surrounding the combustion chambers has reached a good red heat. Then the secondary air is turned on, and when this has ignited the carbonic oxide from the furnace, as shown by the presence of a blue flame at the "nostrils" where oxide and air meet, all danger of explosion is over.

The bench having reached the required heat, the proper conditions for regular, economical running are obtained as follows: The chimney dampers are pushed in, until, on opening the charging door of the furnace and throwing into the fire a handful of coal dust, the resulting flame plays lazily back and forth out of the door, neither being drawn steadily in by the draft nor burning up too vigorously from excess of pressure. If the heat can be maintained with a slight pressure on the furnace great economy of fuel can be attained, but as a rule heats cannot be kept up unless the pressure is cut down practically to zero. There should never be a decided "pull" on the furnace except on special occasions, when the heat has to be brought up quickly, without regard to the quantity of fuel used. The dampers set, the heat is brought to the proper point by increasing or decreasing the primary air opening, the secondary air being kept properly proportioned to the amount of carbonic oxide produced by the furnace.

The proper amount of secondary air opening is determined by noting the disappearance in the take-off flue, or at any convenient point of observation in the waste gas flues of the recuperators where the heat is not too high, of the blue flame that indicates the escape of unconsumed carbonic oxide from the combustion chamber. If this flame is present the secondary air opening is gradually increased until the flame disappears, waiting a sufficient length of time after each slight increase of opening for the extra air to travel through the bench. When the flame is gone the adjustment is right, and the secondary air slides should be clamped. If no flame is present and the adjustment has not been made for some time, the secondary air openings are decreased until the flame appears, and then the adjustment made as above.

The quantity of carbonic oxide produced varying with the condition of the fire as to the amount of ashes, depth of fuel bed, etc., the secondary air supply cannot be kept exactly right for every hour of the day, and this being so enough is supplied to consume the average maximum production of carbonic oxide, since the loss of heat due to the small excess of secondary air present when less carbonic oxide is made, is smaller than would be suffered by allowing an equal quantity of carbonic oxide to escape unconsumed, the loss of sensible heat being practically equal in both cases, while with the unconsumed carbonic oxide there is the additional loss of its heat-producing power. If there is sufficient recuperating surface in the bench, the appearance of any heat above a dark red in the recuperators below the point of entrance of the secondary air, is an almost certain indication of an insufficient secondary air supply, even though no flame can be seen, the flame not being very marked in a highly heated space.

This adjustment of damper and air slides made, they are fastened so securely that it is impossible for them to be moved unintentionally, and a record of the amount of opening is kept so that any intentional change can be at once detected and the responsibility for it fixed. The fastening for the dampers consists of 1¼ x 1¼ inch L's placed above and below the tile, so that the flat sides are toward the front of the bench

when the damper is put in place. These angles project 2 inches beyond the edges of the damper, are bolted together through the projections, and by screwing up on the bolts are made to clasp the damper so firmly that there is no danger of any slip. The amount of opening is regulated by the position of this angle-iron strap, the damper always being pushed in until this strikes the wall. The air slides are clamped by set screws.

Regenerative benches will not give the best fuel results, nor the highest heats, unless the adjustments spoken of above are properly made, and they should not be left entirely to the average retort house fireman, nor even to the average foreman, until he is taught enough of the principles of generator firing to have some insight into what he is trying to do. In any case, regular investigation by the superintendent of the condition of damper opening and air supply will tend to keep down the percentage of fuel used.

It is also necessary for the proper working of a generator furnace that the fuel bed be kept of a good depth, and that this depth be uniform throughout the furnace. The coke being drawn into the furnace through an opening at the extreme front, the natural slope along which it falls leaves the fire much more shallow at the back than in the front, and this tendency has to be overcome by a careful stoking back of the coke as it drops into the furnace. In addition, the coke already in is pushed well to the back immediately before the stoking draw. Not being hampered by the presence of the shute or the heat of the coke falling from the retort, the fireman can work to better advantage at this time, getting the fire banked well up against the back wall and leaving a hollow in front for the fresh coke, into which it can be easily stoked in spite of the disadvantages existing during the draw.[1] Unless the charge is burnt very dry, there is an excess of gas produced as it goes into the furnace, which in connection with the small damper opening required for economical running, causes a back pressure and a vigorous blaze out of the charging door, much to the discomfort of the firemen. To prevent this, the cellarman pulls the dampers wide open during the stoking draw, pushing them in again as soon as the charging lid of the furnace is replaced.

In cleaning the fire there is no need of working from the top of the furnace, and thus allowing a great rush of cold air through the bench. All the work is done through the cleaning door with a good bed of fuel left in the furnace to heat the excess of inflowing air. Secondary bars, resting on supports provided for the purpose, are driven in above the clinker line to hold up the fire, the grate bars drawn, dropping the ashes into the pan, any hard clinker on the walls cut away with chisel bars, the grate bars replaced and the secondary bars withdrawn, letting the fire down upon the grate again. The ashes and clinker are not removed until the work of cleaning is finished. This cleaning is done every 48 hours. To avoid the disadvantage of having the fuel bed left shallow for any great length of time, each fire is cleaned as short a time before the stoking draw for that bench as is possible under working conditions. A schedule can usually be arranged that brings the cleaning not longer than one hour before the filling of the furnace. No steam is blown into the furnace, that needed to keep the clinker soft being made by trickling water over a step grate, the water pan and steps being carefully set in such a way that the water runs forward on each, dropping over the edge against the fire. The water is run in with a sight feed, the amount going in being visible at a glance, and the ash pan is provided with an overflow set to prevent the water rising high enough to flow into the primary air openings in case too much is turned on. The smallest stream that can be made to flow steadily is enough to furnish all the water necessary.

After taking out the ashes dropped into the pan during the cleaning of the fire, the dirt that has worked into the primary air openings is raked out to prevent their gradual closing up. Every six weeks or two months the recuperator flues are also cleaned of the deposit of flue dust formed in that time, as this interferes with the free transmission of heat through the walls to the secondary air. The primary air flues also need regular attention, the bursts of steam caused by the dropping of hot ashes and clinker into the water in the ashpan, when the fire is cleaned, carrying fine dust back into these flues beyond reach from the furnace.

All the work in connection with the furnaces, except the filling in of the coke, is in charge of one man who also makes all changes in the damper and air slide openings as ordered by the Works' Manager, and is paid full fireman's wages. He was selected as the most intelligent of the firemen, and while his job is rather an easy one, especially in summer, his substitution for the cheaper man in charge four years ago has proved an economy, as the heats have run higher and more steady and the fuel account lower since making the change.

1. See Appendix for drawings and descriptions of all tools used.

Having generated the heat as economically as possible, the object sought on the charging floor is to take full advantage of this heat by keeping the idle time of the retorts, that is, the time they are open for drawing and charging, burning out stopped standpipes, etc., down to a minimum.

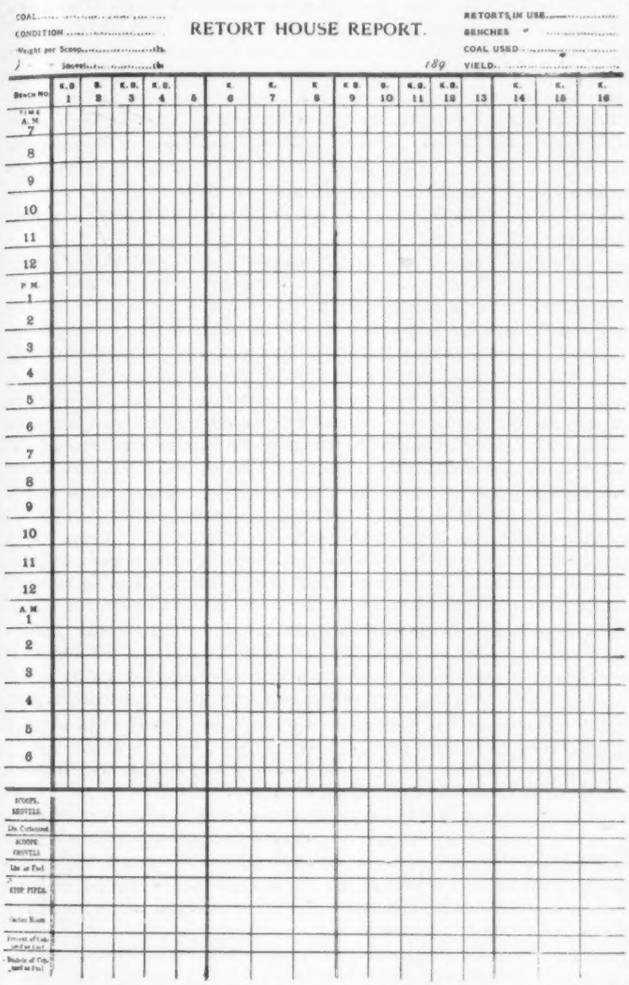
The benches being nines and sixes, both containing a number of retorts divisible by three, the duration of the charge, four hours, is divided into three periods, one-third of the retorts belonging to a gang being charged at each period. (Of course, the different gangs go ahead at different times to equalize the make.) This division into three "draws" gives less work on each than if half the retorts are taken at once, and keeps the heats more uniform, while with four-hour charges the time for rest is not materially shortened, less time being taken for the work on each retort when fewer are handled. The retorts being kept hot enough to carbonize charges of three scoops and a shovel or two of coal, three scoops are provided for each gang, so there is no stopping to fill a scoop while the gas from the coal charged in the first scoop is burning away out of the open mouthpiece. All tools must be at hand, and scoops filled for the first retort before slacking off the lids, and no more retorts are opened at once than are needed to keep the whole gang at work.

The loss of time due to the retorts standing idle while burning out stoppages in the standpipes, which two or three years ago was a very large percentage of the total available time, has been reduced to an almost inappreciable quantity by the simple expedient of keeping the standpipes perfectly clean. That is to say, since it has been made a rule to clean each standpipe right to the iron, removing all deposit, every time that it stops or the retort is scurfed, stopped standpipes have almost entirely disappeared. No retort is charged after being laid off for either of the above reasons, until a ring 5¾-inch in diameter will pass easily down the 6-inch standpipe. In addition the mouthpiece end of the pipe is bored out with a large auger on each draw, and a close watch is kept to see that this boring out is thoroughly done. With a little skill, soon acquired by the fireman, an auger can be twisted over an obstruction with less effort than is required to cut it away, but the foreman is on hand to see that the auger comes out of the pipe with a straight pull, no twisting being allowed. If the auger cannot be pushed up a pipe while the retort is open on the draw, it is tried again after the charge has been in a little over an hour, at which time the deposit is found sufficiently softened to be entirely cut away. For a 6-inch standpipe an auger a trifle over 4¼ inches in diameter at the widest part is used, for a 7-inch pipe one 5¼ inches in diameter, and as soon as steel gauge rings of these sizes will slip over the head, the auger is sent to the blacksmith to be spread out. This test of size is made every morning by the retort house foreman.

Besides the general oversight of the work, this foreman's duties include the patching of the retorts when necessary, and the keeping of a detailed record of the daily working; that is, the amount of coal charged into each retort, the number of retorts the coke from which is drawn into the furnace of each bench, a list of stopped standpipes, and one of retorts out of action for scurfing or for repairs of any kind. This information is all recorded on a single sheet ruled vertically for the benches and horizontally for the 24 hours of the day. In the rectangle inclosed by the lines for each bench and those for the hour nearest the time of each charge, is entered, in the position corresponding to that of the retort in the bench, the number of scoops and extra shovels of coal charged into the retort. If the coke from this charge is drawn into the furnace for fuel four hours later, a check is made against the entry with a red pencil.

The fact that a retort is being scurfed is shown by the presence of the letters C. B. (carbon burner), in place of the amount of coal, each time that the retort should have been charged, while if a standpipe has to be burned out, the letters S. P. (stopped pipe) are inserted in front of the charge (if any) put in after the pipe had been cleaned. A charge lost by reason of repairs to the cotter bar or mouthpiece, is denoted by the letter R in place of the amount of coal. The sheet containing the entries for the previous 24 hours is handed into the office by the foreman every morning, the totals for each bench footed up, scoops and shovels being changed into pounds on the basis of 100 pounds of coal per scoop, and 20 pounds per shovel, and these totals entered on a larger sheet ruled to contain the record for a month. In this way the totals for each month are obtained, and from these it is easy to make up a statement for each year, as well as one for the whole life of each bench. The percentage of fuel used is obtained by dividing the number of pounds of coal, the coke from which is drawn into the furnace during a day, week, month or year, by the total amount of coal charged into the bench during the same period. This percentage is figured out for each bench once

a week and recorded, as a check on the working of the benches. The coal charged is measured by scoops and shovels, because, owing to the arrangement in the retort house of vertical bins opening on the charging floor into which the coal brought from the boats or storage shed is dumped overhead, the weighing of each charge is a matter of great inconvenience. Where it is possible the coal for each group of benches should be weighed separately and charged against the proper benches. This insures more regular charging, as with varying sizes of coal no two scoopfuls will weigh the same, and it is impossible for the foreman to gauge the charges exactly. It also relieves the foreman of the ne-



cessity of staying to see that the charge ordered is put in, which he must do when the coal is shoveled into the scoops from a bin holding 8 or 9 tons. But the assumption that each scoop holds 100 pounds of coal has been found to be fairly exact on the average of a large number of scoops, while for comparative results and percentages it answers as well as a perfectly accurate weight. A record is kept of the total amount of coal brought into the house each day and the yield of gas per pound, and the average weight of charge is figured from this amount.

The normal gang, consisting of three "firemen," has charge of 27 retorts, the drawing and charging being done in common, but each man having his own particular nine retorts, the standpipes of which he must auger from the bottom as previously explained, and from the top should occasion arise for so doing. He is also required to stoke the furnace of the bench in which his retorts are set, and to assist the "top man" in handling the tools employed in cleaning any standpipe among those in his charge that has to be burnt out. On a regular day each week he has to clean off the pitch that accumulates on the inside of the lids of his retorts, and must at all times notice and stop any leak from these lids, keep the mouthpieces clean, break up the large lumps of coal rolling down out of the bins, and sweep up the floor in front of his bench after each draw. If the number of retorts at work is not divisible by nine, the gangs are divided into "firemen" and "helpers," a "helper" having only six retorts to attend to, and receiving two-thirds of a fireman's pay. For instance, if a gang of three men has charge of 24 retorts, it would be composed of two firemen and one helper, the helper's duties being exactly the same as those of the firemen as far as his six retorts are concerned. In a gang of three firemen each takes the "driving," "carrying" and "levelling off" positions on the scoop alternately; but when a helper is in the gang he always levels off, the firemen changing on the two other positions. The "driver" and "carrier" fill the scoops for the next retort, while the third man is levelling back the charge just put in and closing the self sealing lid. By varying combinations of firemen and helpers, any number of retorts can be handled. The principle is really that of piecework, the men being paid a certain sum for each retort under their charge, with nine retorts as the maximum allowance. The average weight of charge for the past year has been 342 pounds, so allowing 1½ retorts out for scurfing to each 27 at work, the weight of coal handled per day by a gang of three firemen figures out as follows:

Retorts.	Charges.	Wt., lbs.	lbs.	lbs.
25½	x 3	x 342	= 26,163 or 8,721 per man per day.	

The coal is brought into the house direct from the boats during the whole season of unloading, at a cost no greater than that of unloading into the coal shed. During the winter it is brought from the shed at a cost of labor of 7¾ cents per long ton. To this must be added the cost of the steam used for running the elevator engine, and the wear and tear on engine, elevator cars and track, items difficult to figure exactly, but which would not amount to more than enough to bring up the total cost of taking the coal into the house to 10 cents per long ton.

The retorts are scurfed by natural draft through the standpipe, the front of the mouthpiece being bricked up and carbon tiles used to carry the air to the back of the retort. At the end of from 24 to 72 hours, the time depending somewhat upon the age and condition of the retorts, but averaging about 48 hours, the carbon is sufficiently burnt away to be cut up and taken out. When a retort is laid off for scurfing, the standpipe is thoroughly augered from top and bottom before the mouthpiece is bricked up, and when the carbon has been removed, the pipe is tested with the ring and if not found clean is cleaned out before the retort is charged. The rule is to keep one scurfer going for each 18 retorts at work.

The tar is run off from each section of hydraulic main twice a day, early in the morning and late in the afternoon, the stopcocks being kept open in every case until liquor runs out freely, and a close watch being kept on the seal during the operation. In case any lumps of thick tar obstruct the pipe they are hooked out through the stopcock, which has an opening full three inches in diameter, the same size as the pipe. If much of this heavy tar is found it is drawn out through the cleaning openings. These are sealed off from the rest of the main by a longitudinal partition riveted to the top and extending far enough below the normal water line to prevent unsealing by the agitation of the water around the dip pipes. A pipe connection provided with a stopcock is made between the two compartments of the main to equalize the pressure, and keep gas on both sides of the partition plate. When the main has to be cleansed the stopcock is closed and the work done without loss of gas.

The liquor overflowing from the mains runs to the tar well and is pumped to an overhead tank, to be used for refilling the mains when the tar is run off.

The speed of the exhauster is such as to maintain a vacuum, or pressure as you choose of 0 inches on the hydraulic main, while the seal is kept between ¾ inch and 1 inch.

The running off of the hydraulic mains and all other regular work on top of the stack is done on the day shift by a "topman," whose duties include also the preparation of the retorts for scurfing, taking out the carbon tiles when the scurfing is completed, assisting the foreman to remove the carbon and patch the retorts, helping the firemen burn out stopped standpipes, and the doing of any little odd jobs necessary about the retort house.

The cleaning of the furnaces is also attended to in the daytime, and the night shifts consists of only the foreman, firemen, and one or more cellarmen to quench and pile the coke.

Although the work of the retort house must go on full seven days a week, none of the men employed it it, not even the foreman, are required, or allowed, to work more than six days, except under exceptional circumstances. Each man has his regular day off, on which he does not have to report for duty unless specially ordered so to do. The men holding steady positions are required to work on Sunday, but can get off occasionally on that day if chance men are on hand to fill their places. This arrangement has been in force in all departments of the works for four years, and it is probable that none of the men would now care to go back to seven days work a week, though at first a few

objected strongly to the enforced day of rest and consequent decrease of income. But they have learned the benefits of the plan by experience, and value their day off quite highly. From the Superintendent's standpoint it has the advantage of training an extra man for each position about the works.

Having thus tried to describe as fully as possible under the circumstances the way in which the regular routine work is carried on in this particular retort house, I close with the hope that other members of the Association will derive benefit from some portion of the narrative, and in return indicate methods of improving our present practice at various points, and so we will help each other to reach that point of minimum cost in holders which is the goal toward which all gas works managers are striving.

Having finished the reading of the paper proper, and the time for adjournment having arrived, a recess was ordered, the reassembling hour being fixed for 2 P.M.

FIRST DAY—AFTERNOON SESSION.

President Clark called the meeting to order, and Mr. Forstall then read the following Appendix to his paper:

APPENDIX.—DESCRIPTION OF TOOLS.

FURNACE TOOLS.—*Secondary Bars.*—Made of 2½ x ⅝ inch refined iron, welded to a piece of 1¼ inch O iron with a 2 inch head for driving with a sledge hammer. These bars are driven through the fire above the clinker line, and hold up the fuel while the ashes and clinker are removed from the lower part of the furnace.

Cleaning Rake for Primary Air Ports into Furnace.—Made of ½-inch O iron, with an eye handle and a small rake end at right angles to main portion of handle. One right and one left, for the two sides of the furnace. Used for raking out the ashes that get into the air ports during the cleaning of the fire.

Stoking Rake.—Made of a piece of 3 x ¾ inch flat iron, 5 inches long, welded in center at right angles to a round rod, tapering from 1½ inches where welded to the flat iron to ⅝ inch at eye handle, and 10 feet 6 inches long over all. Used to push the coke well to the back of the furnace, immediately before and during the stoking draw, to secure an even fuel bed throughout the whole depth of the furnace.

Furnace Shute.—Made of No. 11 B.W.G. iron, bent to proper shape, bound with ½ x 1½-inch flat iron, and provided with legs of ½ x 1½-inch flat iron. It is used to catch the coke as it is drawn from the top and middle retorts on one side of a bench of sixes, and cause it to slide into the charging opening of the furnace into which the lower part of the shute fits, the stoking rake being used to push the coke into the back of the furnace from this opening.

RETORT TOOLS.—*Drawing Rake.*—Head made of ¾ x 3 inch flat iron, 13 inches long, welded to handle at a point 1½ inches from one end. Handle 1¼-inch O iron for 18 inches from head, 1-inch O for 8 feet more, and ¾-inch O for rest of the 14 feet 6 inches length. Eye on end of handle. Used for drawing the coke out of retorts.

Carrying Stick.—Made of ⅝-inch O machine steel, 3 feet 6 inches long over all, and with proper curve in middle to fit the bottom of the scoop. Used for lifting and carrying front end of scoop when charging the retorts.

Scoops.—Made of No. 14 B.W. G. soft steel, cut to size sheets needed (15 inches x 105 inches) and pressed into shape in a press made of three 6-inch pipes with necessary screw arrangements. Reinforced for 16 inches at head with a piece taken from an old scoop. Strip of ⅝-inch x 1¼-inch ◘-iron riveted along outside at bottom to stiffen it. Head made of ¼-inch soft steel bent to proper shape on anvil, with a strengthening piece of ⅝-inch steel put on around opening for handle. Handle of 1¼-inch O-steel upset on inside, and welded outside to a piece of round iron of same size tapering to ⅞ inch in 2 feet. Cross bar of handle ⅞ inch O and 2 feet over all. Used for charging coal into the retorts.

"*Tippler.*"—Made of ⅝-inch O iron with eye handle and short hook on other end tapered down to ½ inch at point. Used on charging floor for slacking off levers, opening lids of mouthpieces, raising the flaps covering the openings through the floor into cellar, and every other purpose requiring the use of a hook.

Levelling Rake.—Made of a piece of ⅝-inch x 3½-inch flat iron cut to a semicircle of 7 inches diameter, welded at right angles to a handle 6 feet long, the first 12 inches of which is 1-inch O-iron and the rest ¾-inch O with an eye on end. Used for levelling back the coal from mouthpiece into retort after the charge; also for closing the lid and pushing in the lever.

Mouthpiece Bar.—Made of ¼-inch O-iron, with eye handle and a chisel end of steel dressed to an edge and tempered, 4 feet long. Used to chip off the tar and pitch that accumulate on inside of mouthpiece lids.

Buck.—Made of two 1-inch ells with side outlets, and the necessary 1-inch pipe to form 4 legs and a cross piece. Used to support the drawing rake and raise it above the bottom of the retort when drawing the bottom retorts, thus saving the fireman from so much stooping in handling the rake on these retorts.

Patchers.—Made as shown on drawing, of different sizes and length of handle. Used to hold fireclay and push it into the required place when patching retorts.

STANDPIPE TOOLS.—*Cutter Head.*—Forged from 2-inch x 2 inch iron, slotted and drilled as shown in drawing for the reception and fastening of cutting tool, and welded to a piece of 1-inch pipe of sufficient length to allow the cutter to reach well into the bend of the standpipes from the bottom retorts. Provided with an eye handle parallel to slot in head so that the direction of the cutter is always known. One of these heads is also welded to a curved handle of ⅝-inch and ¾-inch O-iron, similar to the auger handles. The cutting tools for use in these heads are made of ⅝-inch x 2½-inch steel tempered on edges, of the slope shown on drawing, in sizes increasing by ½ inch from 4 inches up to 5½ inches in extreme width.

This tool is for use in case the carbon in a pipe is too hard to be cut away with the other tools. By its use vertical grooves are cut in the carbon, as shown on the drawing, almost out to the iron. Then the pipe is fired hard for an hour or so; that is, the flame from wood burnt in the retort is drawn up through the pipe, causing the carbon to crack away from the iron, so that it can be broken off in great lumps by means of the "Star," thus cleaning the pipe quickly even when badly stopped owing to previous imperfect cleaning. The whole operation can be performed without the excessive jarring and consequent loosening of joints that is necessary in doing the same work with an auger with the further advantage that standpipes that cannot be cleaned with an auger are amenable to this treatment.

Star.—Made from a cast steel Star Coke Breaker, the points of which are drawn out by the blacksmith to the required diameter. This is fastened to a handle of 1-inch pipe, the length of which is determined by that of the longest standpipe. In two sizes for use for the top of pipes. Also one provided with an auger handle for use from the charging floor. This tool is used as the first and only tool in cleaning pipes from hard stoppages that are not bad, and to follow the cutter in the case of pipes in which the carbon has been allowed to grow thick. The largest size is of such a diameter that when it has cut its way down a pipe the ring will follow easily.

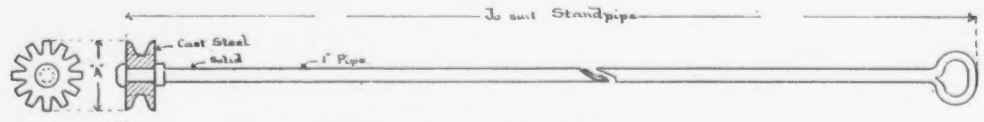
Ring.—Made of ⅝-inch x 2½-inch steel, drawn to an edge as shown on drawing. To it are riveted four ⅝-inch rods welded together at their other ends, the single rod thus formed being welded to a piece of ¾-inch pipe, long enough to allow the ring to drop to the bottom of the longest standpipe. This ring is used merely to detect the presence of any lumps that the Star may have slipped by, and is not used to cut away obstructions of any size. It is made from ½-inch to ⅝-inch less in diameter than the pipes on which it is to be used.

Augers.—Made from steel blanks $\frac{3}{16}$-inch thick, and of shape and size shown on the drawing. Welded to rods 11 feet long, 7 feet at handle end, of which is ¾-inch O and the rest ⅝-inch O iron. These rods have eye handles and are curved as shown. The auger heads are given at least one full turn, and preferably more. These augers are used to clean the lower portion of the standpipe at each draw. Similar heads are fixed on pipe handles for use in cleaning the pipe from above in case of a lampblack or other soft stoppage.

Basket.—It sometimes happens that a pipe is allowed to run so long or is so handled when the cleaning is begun, that it becomes completely choked up with carbon so hard that it is almost impossible to drive even a pointed bar through it. It is for such cases that this *basket* is useful. It is made of a piece of perforated iron, cut from a sheet discarded from a rotary coke screen, is open on one side where it abuts against the front wall of the stack and the bottom has an opening cut far enough back to take in the standpipe. A pair of tongs with clamping ring clutches the standpipe and supports the basket at the proper height.

Its use is as follows: In the case described above, the obstruction is located and the point marked on the outside of the pipe. The tongs are then clamped on at the right place, the basket hoisted up and placed upon them, encircling the pipe and touching the front wall of the stack. A wood fire is started in the basket and kept up until the heat softens the obstruction sufficiently to allow a fair sized opening to be made through it, when it is permitted to die out, and the pipe is burnt clean in the regular way. This basket should not be required more than once

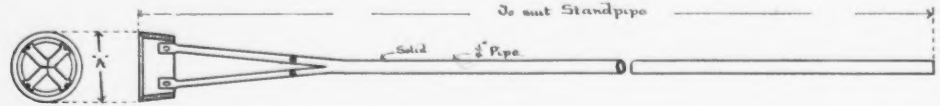
"A" equal 4 4½", 5" & 5⅝"



"A" = 4½", 5, & 5⅝"

Cast Steel Star with 1in. Pipe Handle.

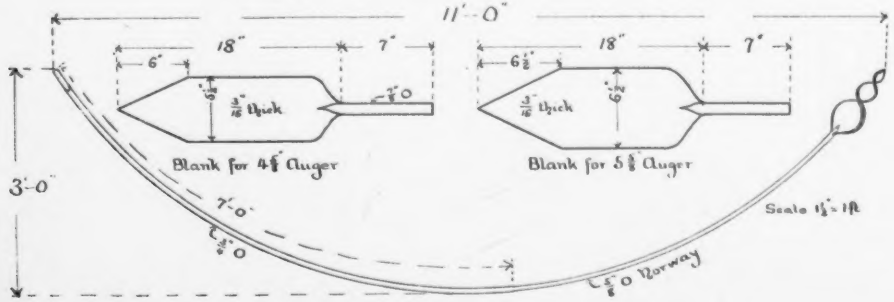
Used from top after Cutter. Also one with Auger Handle.



"A" = 5⅝"

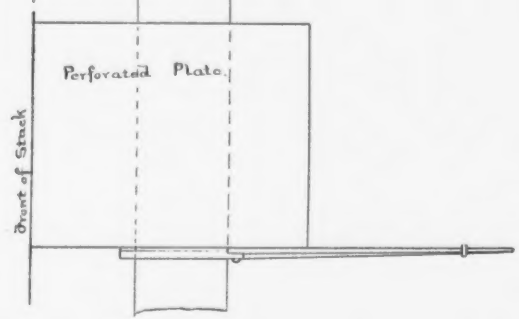
Ring for testing Size of Opening in Standpipe.

Used from top after Star. No retort charged after scurfing or burning out pipe, until this Ring goes down the pipe easily.



Auger and Auger Blanks.

The same style Auger heads also fitted with pipe handles for use on top



Basket of Perforated Sheet Iron.

Filled with fire and clamped on Standpipe by means of tongs at proper spot to soften by external heat obstructions completely blocking Pipe and too hard to make hole through.

Standpipe Tools.

For Regular Use and for Emergencies

Scale 3 in = 1 ft

Top View

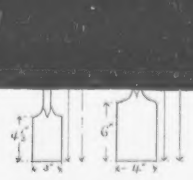
Charging Scoop for 16"x 26"x 9'-0" Retorts.

These Scoops are made of #14 soft steel, bought in sheets 15"x 105" and pressed into shape by an arrangement of Steel 6" pipes with clamps so that one of the pipes is pressed down into the sheet bending it as desired. The reinforcement shown near handle has been found necessary to prevent breakage.

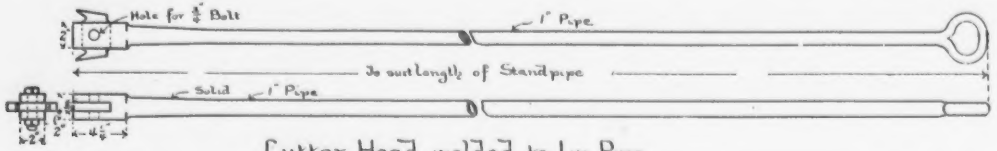
other Charging Floor Tools.

Scale 3in.=1ft

Note. All material not specially marked is Burdens. Best iron

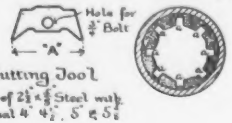


Patchers for Retorts



Cutter Head welded to 1in Pipe.

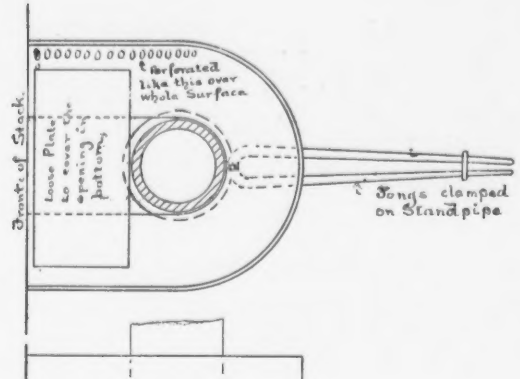
This is to be used from top of Standpipe. Also one with curved handle, same as Augers to clean out Mouthpiece end of pipes

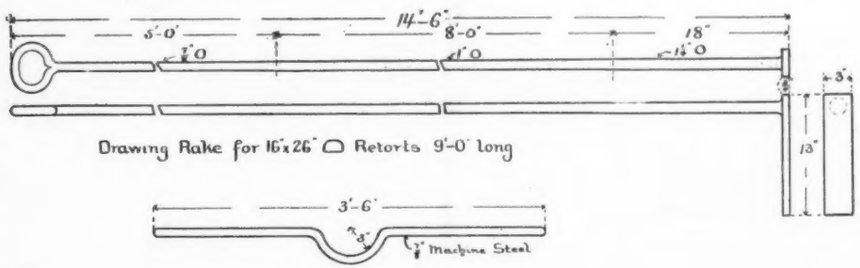


Cutting Tool

Made of 2½ x ⅝ Steel with "A" equal 4" 4½", 5" & 5½"

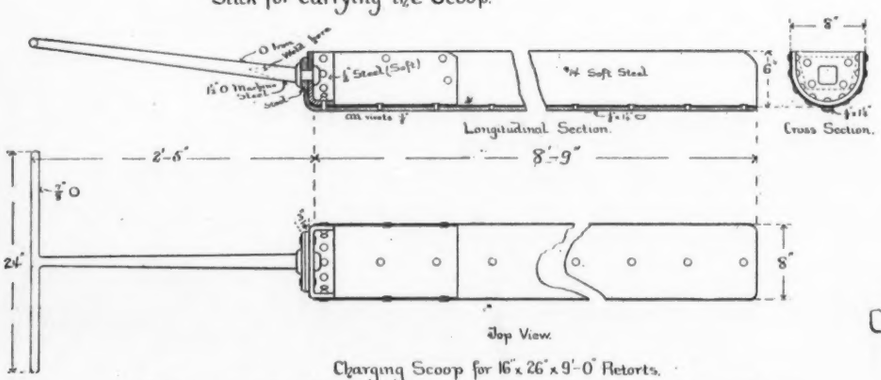
Cross Section of Standpipe showing the Grooves a,a, made by Cutter preparatory to using Star to break Carbon off


Front of Stack
Loose Plate to cover the opening in bottom
Perforated like this over whole Surface
Tongs clamped on Standpipe



Drawing Rake for 16"x26" ⌓ Retorts 9'-0" long

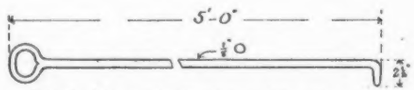
Stick for Carrying the Scoop.



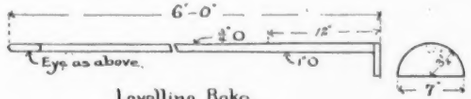
Top View.

Charging Scoop for 16"x26"x9'-0" Retorts.

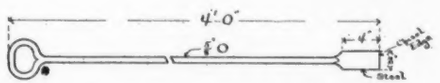
These Scoops are made of #16 soft steel, bought in sheets 15"x108" and pressed into shape by an arrangement of Wrought 6" pipes with clamps so that one of the pipes is pressed down into the sheet bending it as desired. The reinforcement shown near handle has been found necessary to prevent breakage.



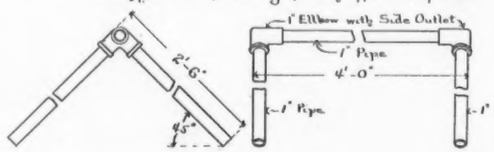
"Tippler" for opening Mouthpiece Lids, etc.



Levelling Rake.



Mouthpiece Bar for cutting the Pitch off inside of Lids

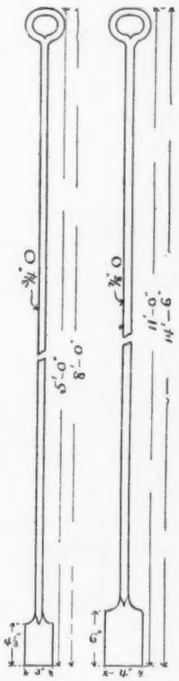


Buck for Support of Rake when drawing Bottom Retorts.

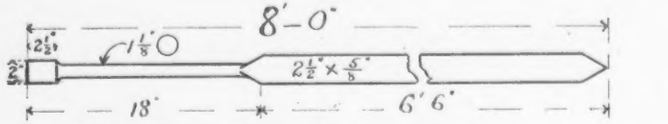
Charging and Drawing Tools, and other Charging Floor Tools.

Scale 3in.=1ft.

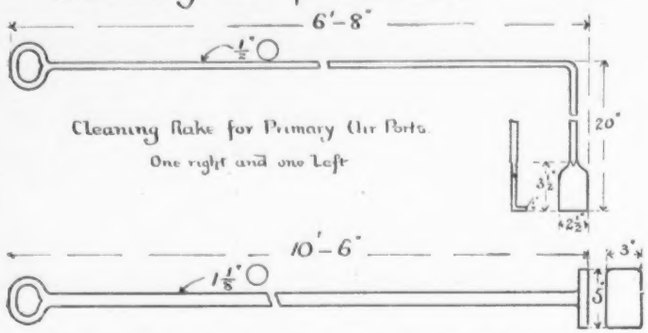
Note. All material not specially marked is Burden's. Best iron



Patchers for Retorts



Secondary Bars for Furnaces.

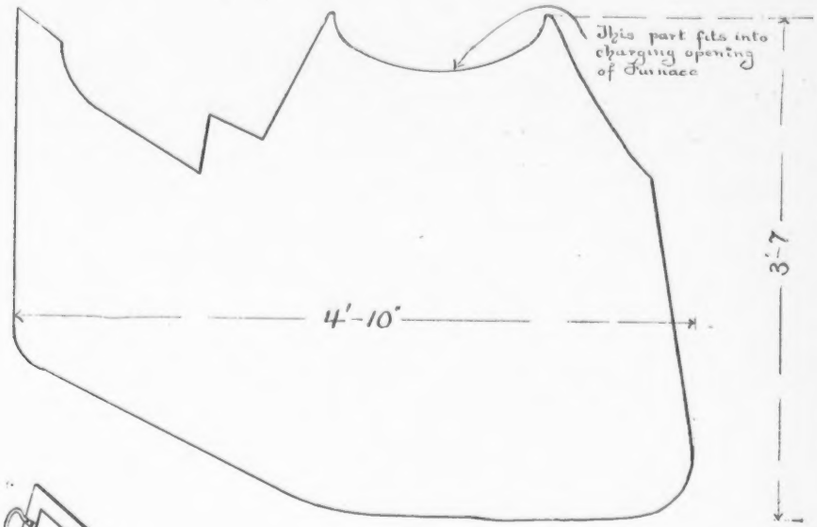


Cleaning Rake for Primary Air Ports.
One right and one Left

Stoking Rake for Pushing Coke to Back of Furnace.

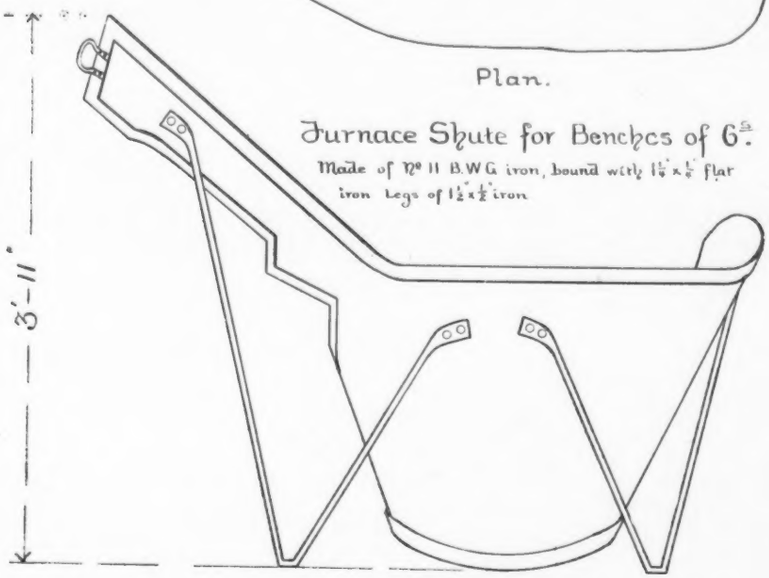
Furnace Tools.

Scale 3in = 1ft.



Plan.

Furnace Shute for Benches of 6 Cs.
Made of No 11 B.W.G. iron, bound with 1½"x½" flat iron Legs of 1½"x½" iron



Front Elevation

a year or so, in fact in the works under consideration it has not been in service for over two years, but it is a convenient thing to have around when it is needed.

Note.—The dimensions given on drawings are for tools to be used in 6-inch standpipes, and should have 1 inch added for 7-inch pipes.

Discussion.

The President, in inviting discussion on the paper, remarked that the topic dilated upon by Mr. Forstall was a most important one.

Mr. Butterworth asked Mr. Forstall what method he followed in scurfing his retorts.

Mr. Forstall replied that he favored the plan known as the Edge steam system.

Mr. Thompson, referring to the ventilation of retort houses, instanced the practice in vogue at the Shore Harbor Station of the Brighton (England) Gas Light Company. There the stacks were located in an open space, covered at the top, wherefore the heat from the benches caused an ascending draught sufficient to keep the interior of the retort house fairly clear of noxious vapors and smoke. Mr. Thompson further thought that hydraulic mains should be placed well above the stack tops, and that he favored shallow seals. In "burning out," the practice at St. Louis was to clear out the stand and bridge pipes before scurfing. He ran one scurfer to 16 retorts, as against Mr. Fostall's use of one scurfer to 15. He thought, too, that 100 pounds of coal to the scoop weight was rather light, although there could be no way of fixing a weight rule on that account. Mr. Thompson then explained the nature of the house tools in use on the Laclede works, remarking that, having tried tapering augers for some years there, they now preferred to employ a different shape. He agreed that the men generally appreciated the requiring from them of only 6 days' work in the week.

Mr. Mitchell agreed with about everything Mr. Forstall said in his paper, to which he had listened with a great deal of pleasure. He would like, however, if Mr. Forstall would explain how he shielded the iron mouthpieces from the effects of the intense heat to which they were subjected during the time the scurfing of the retorts was going on.

Mr. Forstall admitted that a scoop weight of 100 lbs. was low and that a shovel weight of 20 lbs. was quite the reverse. That, however, was the practice at the Newark works when he went to them, and the practice was kept on. The average charge was 340 lbs. of coal. He had had no practical experience with water jet, although he was familiar with the theory thereof. They used a single auger for pipe clearing—4¼-inches diameter for a 6-inch pipe, and 5¼ inches for a 7-inch pipe. They never allowed one rake to be used in drawing more than two retorts. In fact, their plan was to keep the blacksmith out of the retort house as much as possible. In reply to Mr. Mitchell's question Mr. Forstall explained the operation of the Edge process of scurfing, the nature of which was to obviate any injury to the mouthpieces on the score feared by Mr. Mitchell.

Mr. Egner was pleased to learn that Mr. Forstall agreed with his (Mr. Egner's) practice, instituted in a New York city gas works about 22 years ago—that of asking the men to labor only six days out of the seven. Mr. Egner also thought that the weight of coal handled by Mr. Forstall's men at a time in charging was on the heavy side.

Mr. Harbison's only objection to Mr. Forstall's brilliant paper—an objection, however, that applied to a precept rather than to the text of its presentation—was that he worked his men six days and paid them only for the six days. In Hartford the men were paid seven days' wages for six days' labor, and ample storage room was the way to arrive at this concession to their workmen. Mr. Harbison submitted that the Hartford practice was the rational way of permitting a company's men to share in its dividend earning powers.

Mr. Littlehales believed in the system of working the men only six days in the week, but preferred to increase the force by one-seventh, rather than by obliging the men to perform sufficient extra work in the six days to make up for their resting time on the Sabbath.

In response to an invitation from the President, Mr. Geggie (Quebec) said the practice there was to construct a separate hydraulic main for each set, the main being carried over and along the bench, on a girder, at a height of 4 feet above it. The standpipes were of wrought iron, 6 inches diameter, and the mouthpieces were large. This construction reduced the tendency to stoppages in the benches to a minimum.

Mr. Harper related a difficulty experienced by him at Altoona, Pa., in scurfing retorts, subsequent to the introduction of a partial system there of water gas manufacture.

Mr. Harbison suggested that Mr. Thompson, in his well-known capacity of "Wrinkle Department Editor," would confer additional benefits on the gas industry if he should describe the best form of hot coke barrow—a very troublesome factor at present in the list of "retort house tools."

Mr. Forstall said his Company would stop Sunday labor on its works if it could, but the difficulty was in the lack of holder capacity—although the latter was ample with continuous working.

Mr. Egner, in moving a vote of thanks (seconded by Mr. Littlehales, and adopted), again complimented Mr. Forstall on the excellence of his paper.

[To be Continued.]

Obtaining Cyanogen or Its Compounds from the Gases Resulting from the Dry Distillation of Substances of Organic Origin.

THE above is the title of an application for British Letters Patent (No. 16,149) eventually issued to Mr. H. Dreshchmidt, of Berlin, Germany. The specification, as compiled by the inventor, is:

This invention refers to a process for obtaining, on an industrial scale, cyanogen or its compounds from the gases given off in the dry distillation of nitrogenous bodies of organic origin—including all kinds of fossil coal (whether pit-coal, lignite or bituminous shales) turf or wood.

It is well known, the patentee remarks, that gas obtained from coal—whether in the manufacture of illuminating gas or coke—contains after the elimination of the tar vapors, other impurities, carbonic acid, sulphureted hydrogen and ammonia, together with a small amount of cyanogen compounds (hydrocyanic acid). Gas yielded by turf or wood contains but little sulphureted hydrogen or ammonia, but a large quantity of carbonic acid. To isolate and recover the cyanogen from such mixtures of gases, the well-known property of cyanogen, of forming double compounds with the alkalies or alkaline earths in the presence of a second base, has been utilized; and these double salts are decomposed with difficulty or not at all by sulphureted hydrogen or carbonic acid, while all simple cyanogen compounds undergo a more or less easy decomposition under the action of these two gases. The tendency of cyanogen to form such stable double compounds is so great that it or its compounds (hydrocyanic acid), acting on a suitable heavy metal—such as iron, manganese, zinc, etc.—in the form of oxide, carbonate or sulphide, in the presence of oxide, carbonate or sulphide of potassium, sodium, ammonium, magnesium, calcium or other alkaline earths, are able actually to set free carbonic acid or sulphureted hydrogen, and to form double cyanogen compounds of a heavy metal and an alkaline metal or alkaline earth metal. Attempts have been made to bring about the formation of such double cyanogen salts, with a view to the separation and recovery of the cyanogen in the gases of combustion, by passing the gases through solutions of the oxides, carbonates or sulphides of the alkalies (such solutions containing also the oxides, carbonates or sulphides of the metals referred to), by using a fluid in which, with the metallic compounds alluded to, there were present in suspension the oxides or carbonates of magnesia, chalk or other alkaline earths. It was thought impossible to obtain by any any other mode of procedure the intimate simultaneous contact of the cyanogen with the alkali or alkaline earth base and the metallic base, which is essential to the rapid and certain conversion of the whole of cyanogen into the desired stable double cyanogen compound.

In this process, however, the disadvantage is experienced that it is difficult to pass gases through fluids in which solid materials are, and must be, kept in a state of suspension, and complicated apparatus is nesessary to effect it; while, on the other hand, gases can be passed with facility through solid materials which are porous and absorbent, as is done on a large scale in the purification of illuminating gas by masses of oxide of iron. It has not heretofore been considered possible—nor has it, indeed, been possible—to effect by this (dry) method the combination of cyanogen in large quantity and in a concentrated form. It has been thought that with dry materials, it only happens to a slight extent that the cyanogen comes into contact with the metal and the alkali simultaneously and everywhere; and it is has been further thought that, when solid materials are employed, the cyanogen compounds as they are formed enclose the remaining portions of the mass, and protect it against further action.

The object in the present invention, therefore is to eliminate all the above disadvantages, and so to effect the isolation and the recovery of cyanogen from gases by employing solid porous masses in contrast to the previously used methods consisting in the use of fluids. To effect this object, the solid materials to be employed must be so prepared that the gas may obtain access to all parts of the mass at as nearly as posble the same time, and that the gas shall encounter at all points sim-

ultaneously the compounds of the light and the heavy metals in the proper proportions. If it were sought to fulfill the required conditions by preparing the mass which is to form the cyanogen compound, by steeping the oxide or carbonate of the metal with an alkaline solution it would never be possible, the patentee points out, for more than a proportionately small quantity of alkali to be taken up, if the mass be intended to remain solid. The mass would, moreover, become hydroscopic, and but slightly penetrable by the gas. The alkalies alluded to above would, therefore, according to the present invention, be of necessity excluded when it was desired to form a solid absorption mass. But even for the other substances the process of steeping would not be available; for, in the form of their oxides or carbonates, they are considerably less soluble than the alkalies, if soluble at all, indeed so that the proportion of light metal taken up by the materials containing the heavy one would be still smaller than when the alkaline solution was used, nor would a mechanical mixture of the materials alluded to afford the desired result. Not even as the result of the most intimate mechanical mixture would the separate particles of the various substances lie closely together, and be evenly distributed to an extent which would secure that at the same time the cyanogen should come into contact with the various substances necessary to the formation of a double cyanogen compound in the proportions required. Moreover, the porosity itself must be of such a kind as to allow the gas to come into absolute molecular contact with the solid material at all points, and to prevent a protective casing from enclosing considerable portions of the mass, to the exclusion of further chemical action. This object cannot be attained by any process of mechanical mixture.

According to the present invention, the isolation and recovery of cyanogen from gases may best be effected by bringing the gases in question into contact with solid materials, in which the oxide (anhydrous or in the form of hydrate or of carbonate) of the light metals referred to above—*i. e.*, metals of alkaline earths, such as magnesium, calcium, barium, strontium—are present in the required proportion of from one to two molecules, in a mixture of one molecule of the oxide (anhydrous or in the form of hydrate or of carbonate) of a heavy metal, such as iron, manganese or the like, which form, with the metallic salts referred to, and cyanogen, double compounds, which are not decomposed by sulphureted hydrogen or carbonic acid. The materials alluded to must, however, be mixed by chemical means, since mechanical methods are useless, so that the molecular contact may be so intimate and the porosity so perfect, as to afford the gas access as complete as possible to every particle of the mixture. The chemical mixture, which thus brings about the perfect homogeneity of the material, and the most thorough porosity possible, may be effected by precipitating the oxides (anhydrous or in the form of their hydrates or carbonates) of the heavy metals characterized, in the presence of, or in association with, the oxides of the light metals of the alkaline earths; and this may appropriately be effected by means of the oxides or carbonates of the alkaline or alkaline earth metals. Oxides of the light metals may also be precipitated in the presence of oxides or carbonates of the heavy metals from their solutions, by means of oxides or carbonates of the alkaline metals, so that the precipitation may take place, as it were, inside the masses of carbonates or oxides of the heavy metals.

The mode of manufacturing the porous mass may be further explained by means of the following examples :—

1. The pulverized oxides (as such, or in the form of hydrates or carbonates) of the light metals of the alkaline earths are suspended in water, and solutions of heavy metals—as iron, manganese, zinc, or the like—allowed to flow with constant stirring; the heavy metals being those which, in combination with cyanogen and the light metals mentioned, form double salts, which are not capable of being decomposed by sulphureted hydrogen or carbonic acid. By the chemical action of the oxide of the light metal of the alkaline earth, the oxides (*i. e.*, as such, or in the form of their hydrates or carbonates) of the heavy metals are precipitated in a state of fine division, and in the most intimate molecular contact with the portion of the oxide or carbonate of the light metal which is present in excess of the quantity required to bring about the chemical reaction referred to. The proportions present in the mixture may be adjusted so that one molecule of metal in the oxide of the heavy metal is present to one or two molecules or atoms of the oxide of the light metal of an alkaline earth. The oxide or carbonate of the light metal which takes part in the reaction may also be replaced by an equivalent amount of a precipitating material which has the same action as alkali or alkaline carbonate. The salts of the metals must not be such that the acid they contain unites with the oxides of the light metals to form insoluble compounds which have no affinity for cyanogen—*e. g.*, sulphuric acid with oxide of calcium. The precipitate resulting consists of the oxides or carbonates of the light and heavy metals, and is separated from the fluid, washed, dried and powdered.

2. The oxides or carbonates of the light metals aforesaid may also be treated with a solution of the salts of the heavy metals, until the insoluble mass has the composition mentioned in paragraph No. 1. In this case, too, the metallic salt selected must be such a one as was referred to as regards the acid contained in it. The resultant mass is then, as already described, washed, dried and powdered. The mass described differs from Laming's mass, employed for the elimination of sulphureted hydrogen from gas, inasmuch as it has a different composition, containing neither chlorides nor sulphates.

3. A solution containing the salts of the light metals, and those of the heavy metals as well, is allowed to flow into one containing the oxides or carbonates of the alkalies, or, if magnesium salts be employed, into milk of lime. The kind of salt of the heavy metal, the composition of the precipitate, and the further treatment of the latter, are the same as those described in paragraph No. 1.

4. The oxides of the heavy metals may be first of all mixed with a solution of those of the light metals, and then, in order to separate out the oxides (in the specified form, such as oxides, hydroxides, carbonates) of the light metals, be further treated with a solution of oxide or carbonate of an alkaline metal; the remaining conditions, and the treatment of the resultant product, being as above. The mass thus obtained, in a state of the greatest attainable freedom from constituents which have no action upon cyanogen, is so homogeneous and so perfectly porous, that the gas is able to act upon every portion of the mass, and finds at the same time, at every point, the proper proportions in the mixture. The mass is utilized for the absorption and isolation of the cyanogen in a way exactly similar to that in which the ordinary gas purifying materials are made use of, by spreading it out upon wooden hurdles or gratings in cleansing chambers, and passing the gas over and through it. The absorption of the cyanogen, says the inventor, is both rapid and certain, in spite of the fact that both sulphurated hydrogen and carbonic acid are present in the gas. If the mass be saturated with cyanogen, or when the absorption of it has ceased, the mass is removed and treated in any way to obtain the cyanogen compounds.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, October 10th, 1895.

Water Gas in England—An Historical Chimney—The Markets for Residuals.

It is a somewhat significant fact, in connection with the progress of our industry, that in a recent number of the *Journal of Gas Lighting* there appears, consecutively, two descriptions of new installations of water gas apparatus. The first was erected at Liverpool by Messrs. Humphreys & Glasgow, and the second at Blackburn by the operators of the Merrifield, Westcott and Pearson patents. The Liverpool installation is specially worthy of notice, not merely on account of its size, but because it is independent. The present capacity is 3½ million cubic feet per diem, and the plant is laid out for ultimate extension to 7 millions per diem, but it is a separate water gas works supplying its product direct to the consumers. In all previous examples of water gas plant erected in this country, the object has been to provide an auxiliary to coal gas works, for the purpose of enriching the gas to the extent of a candle or two. The Liverpool Gas Company occupy an almost unique position in being under obligation to supply 20-candle gas, whereas 16-candle is the usual standard in our principal towns and elsewhere, and even with the most modern and improved forms of condensing apparatus it is not possible to turn out a 20-candle gas from ordinary bituminous gas coals. An important proportion of cannel or other high class material must be used, and in times gone by the Liverpool Gas Company have imported considerable quantities of cannel from Australia. Their gas is tested by a flat flame burner, and it is narrowly watched by a corporation who, for some not very obvious reason, are not inclined to be friendly, and would have no objection to catch the Company tripping and mulct it in penalties. So the water gas plant has not been erected in a corner of one of the coal gas stations, as a sort of enriching or carbureting apparatus, but stands by itself, and supplies the consumers with straight water gas of 21 or 22-candle power, interchangeably with coal gas from other stations. The new plant will not only get rid of the surplus coke, but reduce the cannel bill, and it will afford practical evidence of carbureted water gas and its capabili-

ties as compared with coal gas of similar quality. There is not only the effect of a large proportion of carbonic oxide in the gas, but also that of the heavier specific gravity to be considered. This is partly to be met by supplying the water gas rather higher in quality than the coal gas. We shall watch with interest to see if cases of poisoning, or complaints of short supply arise within the area fed from the Liverpool water gas plant. If any difficulties occur they certainly will not be hoodwinked by the corporation officials.

The Blackburn apparatus has a nominal capacity of 1¼ million cubic feet per 24 hours, and the results of a 12-hour trial of one-half the apparatus (which is in duplicate) were a make of 350,000 cubic feet of 20.6-candle gas, with a consumption of just over 3 gallons of Russian solar distillate oil, 31½ pounds coke in the generator, and 6 pounds coke under the boiler, for each 1,000 cubic feet of gas produced. One of the special features of this make of apparatus is a new kind of separator, for separating the residual tar from the water used for scrubbing, which is claimed to be so efficient as to admit of the water being used over again, while the tar may be utilized as fuel. A gas works where the only residual is consumed as fuel on the premises will certainly be regarded with envy by those who have to sell coke and tar and to manufacture sulphate of ammonia.

An object well known to visitors to Edinburgh is about to disappear under somewhat unusual circumstances. I allude to the chimney at the corporation gas works, which is perhaps more prominent than picturesque, as few people consider a tall chimney stack a desirable addition to landscape scenery of the character usually described as "romantic." The gas works are situated in a decided hollow between two of the hills for which the neighborhood of the Scottish metropolis is celebrated, and one of these prominences is occupied by high class residences, while the other is a popular resort on account of the beautiful views obtainable from it. The gas works is surrounded by streets and houses on all sides, and as soon as it came into operation on a respectable scale, complaints of smoke, smell and sulphur were incessant, especially from the high level districts. The coal used is somewhat high in sulphur, and it was asserted that silver or any bright metal work was rapidly blackened and tarnished. The result was that, about 50 years ago, when the undertaking was the property of a private company, a spirited endeavor was made to obviate these troubles by the erection of the structure now under consideration. It was designed by Mr. Mark Taylor, who was then engineer of the gas works, and attracted a great deal of attention as one of the tallest and largest chimney stacks in the country. A description of it is included in many works that profess to deal with this kind of structure. The soil on which it stands is a stiff blue clay, hemmed in by rock on two opposite sides, and a start was made by laying a square foundation 6½ feet thick, each side of which measured 40 feet. On this was placed a heavy stone pedestal rising about 70 feet—a respectable height for the whole of a chimney under ordinary circumstances—slightly battered at the sides and 28 feet square at the top, which furnished the base for a stack of brickwork, 264 feet high, about 26 feet in diameter at the bottom, and something less than 20 feet at the top. The total height of this magnificent piece of work is 330 feet, and the cost has been stated at £5,000. It stood the suns and snows of 50 years, but a few months ago began to settle on one side, and is now 5 to 6 feet out of the perpendicular. This defect alone can be remedied, but on account of other unsatisfactory features it has been decided that the chimney must come down.

The cause of the settlement is of course to some extent a matter of surmise, but two circumstances may be mentioned. The first is that a railway company have been cutting a tunnel through one of the hills, approaching (it is said) to within a hundred yards or so from the shaft. The ground to be moved is hard rock and powerful blasting materials have been used, the concussions of the blasts being very violent, according to the statements of residents in the vicinity. The clay is water yielding, and is pierced in several places by deep wells, from which large supplies of water have been obtained. Since clay is impervious to water, this necessitates the presence of faults or fissures. So the theory has been suggested that the blasting operations may have led to the draining away of water from under the chimney and thus caused the settlement. After standing so long it would appear that something must have recently happened to interfere with existing conditions. The size of the foundation is ample in proportion to the height, and the unusually large diameter of the chimney is favorable to its stability.

Considerable diversity of opinion exits as to how the chimney is to be replaced. Probably the question of the removal of the whole works to another site will come to the front at no distant date. The general idea seems to be that a much shorter chimney will answer the requirements. If the works had still been the property of a company, it is probable that the corporation would not have abated a jot in respect to the height of the new chimney; but now they think about 200 feet sufficient. This is the usual way in which public interests are looked after by corporations. I have known instances in which the sulphur clauses have been rigidly enforced, and the company fined for every excess of sulphur, whether willful or otherwise. Go into the same place after the works are passed over to the corporation. The sulphur clauses have probably been left out altogether, and the gas contains twice as much sulphur as was formerly the case. Or take the illuminating power. Many of the corporations contend that the official tests are too favorable, and want to supplement them with a portable photometer, with which "snap shots" can be taken at the gas at the end of blind mains and services, or in any locality that seems to afford the gas examiner a favorable opportunity for justifying his existence. But after the corporation buy up the undertaking the peripatetic apparatus goes to the lumber room. A photometer is fixed at the gas works, and the manager must have 24 hours' notice of the examiner's visit. What is sauce for the company is not sauce for the corporation. Oh, no! The Company must provide a 330-foot chimney, but the corporation can do with 200 feet.

An interesting commentary on the various products obtainable from tar and ammoniacal liquor is furnished by an advertisement in a chemical journal, which states that the Gas Light and Coke Company of London are manufacturers of "Prussian blue, prussiate of potash, cyanide of potassium, sulphate, chloride, nitrate and liquid ammonia, carbolic acid, nathphaline and creosote." All this from substances which for years were regarded as waste, and as such delivered into the nearest ditch. Of course it is only the very large scale of operations on which this undertaking is worked, that renders a chemical works a possible auxiliary. Theoretically it is the duty of everyone to prevent loss as much as possible, and useful matters should not be allowed to go to waste. But in business this sentiment must give way to commercial consideration. What is the use of manufacturing these and other valuable commodities if a fair price cannot be realized for them? If, as in the case in the sulphate worked at the present time, speculators combine to bear down the prices. It is an open secret that the large quantities of chemicals turned out by the gas light and coke companies, have on more than one occasion, attracted the attention of those gentry who find it more pleasant and profitable to deal in syndicates, rings and corners, thus securing a living at other peoples expense, than to get an honest livelihood by their own personal exertions. Especially so with residuals, such as coke, tar and sulphate, which are produced in regular proportion side by side with the output of gas. Already the water gas apparatus is doing valuable service in diminishing the supply of coke on the market, and thus curtailing the operations of speculators who worked for low prices; and a corresponding element in the matter of tar and ammonia is very badly needed, as in regard to both these products, gas companies are at present able to realize only nominal prices. One can understand that there may be over-production on the one hand and little or no demand on the other; but when there is steadiness, both as regards supply and demand, and yet the seller finds himself pressed to accept repeated and frequent reductions in price, there is reason for dissatisfaction. We hear so much about the valuable products obtainable from tar, and about new uses for ammonia, that there is good reason to look for better prices rather than worse, and to think that gas companies ought to participate, to a greater extent than they do at present, in the intrinsic value possessed by these substances. And especially is it desirable to be provided with other outlets for ammonia, in addition to the sulphate.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Mr. Durand Woodman, who is well known to our readers through his contributions to our columns, has been elected Secretary and Treasurer of the New York Section of the American Chemical Society.

Mr. Jacob G. Miner, of 823 Eagle avenue, New York city, writing the Journal, under date of the 17th inst., says:

To the Editor American Gas Light Journal: In your issue of October 7th, 1895, p. 575, middle of first column, you mention the fact that Pelham Manor, N.Y., is now lighted with Welsbach lights, and in your issue of the 14th inst., p. 616, second column, you refer to Excelsior Springs, Mo. Allow us, as old subscribers to and advertisers in your Journal, to say that the lamps used in both those places are the Miner No. 2 lamps, with wind guards and Welsbach burners. They are also in use in many other places with the Welsbach lights, and have in all cases proved perfectly satisfactory.

MR. JAS. M. CHISHAM, Secretary and Superintendent of the Atchison (Kas.) Gas, Electric Light and Power Company, has applied to the City Council for the right to distribute steam from a central station to the residents of that city.

AT the annual meeting of the Troy (N.Y.) Gas Company the following Trustees were elected: Messrs. A. Bleecker Banks, A. E. Bonesteel, Anthony N. Brady, Thos. Breslin, Fred. E. Draper, James Fleming, S. O. Gleason, George P. Ide, William Kemp, F. J. Molloy, Edward Murphy, Jr., R. C. Pruyn and William A. Thompson.

THE Sante Fe railroad system passenger coaches are to be equipped for lighting by means of Pintsch gas.

ACCORDING to the report of Superintendent Knowles the quantity of gas manufactured at the Richmond (Va.) municipal gas works during the month of September last was 12,857,400 cubic feet, as against 13,170,200 cubic feet for the same month in 1894. The average illuminating power of the gas for the month was 19 candles.

THE "main offices" of the Medina (N. Y.) Gas and Electric Light Company are to be removed to this city.

THE suit of the West Gas Construction Company, for the recovery of $15,000 from Mr. G. R. Harms, on account of the construction of a gas plant by plaintiff at East Liverpool, O., has been dismissed "without prejudice."

THE Berlin Iron Bridge Company, of East Berlin, Conn., has recently completed, for Messrs. Wilmot & Hobbs, of Bridgeport, Conn., a new rolling mill to take the place of the one lately destroyed by fire. The main mill is 126 feet wide and 200 feet in length, with engine and boiler room attached in a separate wing, 64 feet wide by 90 feet long. The construction is entirely fireproof—no wood being used about the building. In fact, the risk from fire is absolutely eliminated. The roof covering is the Berlin Iron Bridge Company's patent anti-condensation corrugated iron material.

AT the annual meeting of the Conshohocken (Pa.) Gas Light Company the officers chosen were: President, Frederick Light; Secretary and Treasurer, Henry M. Tracey; Managing Director, Richard H. Bate—the officers, together with Messrs. Jno. F. Bowker and Isaac C. Jones, comprise the Board of Directors. Mr. John K. Light, of course, was continued as Superintendent, and his annual report to the owners of the Company's operations last year assures them that gas is the light of to-day and to-night and to-morrow in Conshohocken.

"E. P. C.," writing to the JOURNAL from San Francisco, under date of 15th inst., says: "A Welsbach burner, out of doors, set on a Wilder governor, adjusted to burning 3.1 cubic feet per hour, has burned for 1,464 consecutive hours in San Francisco, and has consumed 4,625 cubic feet of gas, or an average of 3.15 cubic feet per hour. The mantle is still in perfect condition, and there is shown only a trifling diminution in the amount of light given.——On October 10th the San Francisco Gas Light Company adopted a system of loaning gas cooking stoves and ranges to its consumers free of charge for setting up and connecting, and with separate meter thereto attached. This is with gas at $1.75 per 1,000 cubic feet, although the consumer has the privilege of buying the stove or range outright, thus owning the same, and by doing so can have gas for it at a slight reduction from $1.75—namely, $1.65. It seems, however, that the consumers prefer the $1.75 rate and the borrowed apparatus, rather than the $1.65 rate and ownership of the apparatus through purchase. The accompanying agreement, which Company and consumers both must sign, sets forth the conditions of the loans.——Mr. McNeill, President of the Santa Cruz Company, will have something to say shortly, through the JOURNAL, respecting a subject in which both gas and electric lighting companies are almost equally interested."

THE text of the agreement between the San Francisco Gas Light Company and consumers who engage in the use of gas for fuel purposes is appended—every range or stove placed by the Company carries on its front a brass plate with the following inscription: "Property of the San Francisco Gas Light Company. Range No.....:"

SAN FRANCISCO GAS LIGHT COMPANY.

Gas Stove Agreement.

SAN FRANCISCO,.....189

The San Francisco Gas Light Company hereby agrees to loan to ....., ...street, San Francisco, ...Gas .....Stove No....., and connect same free of charge with independent meter, and supply gas at the rate of $1.75 per 1.000 cubic feet.

Mr.... ..... , a consumer of the gas of the San Francisco Gas Light Company, agrees to use the gas of said Company for ....purposes, to use said stove only upon said premises in the city of San Francisco, not to remove the same therefrom, and to return said stove to the San Francisco Gas Light Company in good condition, save reasonable wear and tear, on demand, and it is hereby agreed that said stove shall remain the property of the San Francisco Gas Light Company.

Witness:..... .....

MR. HENRY EARLE, for many years in charge of the works of the Lexington (Mass.) Gas Light Company, has severed his connection with the Company. He has purchased a plantation near Tallapoosa, Ga., where he will determine practically the value of sulphate of ammonia as a fertilizer. The best of good wishes to him.

MR. CHARLES A. TOWNE, of Orange, Mass., formerly a member of the Massachusetts Board of Gas and Electric Light Commissioners, has been nominated for Councillor of the Eighth District of Massachusetts.

MR. THOMAS J. MULLIN, Inspector of the Brookline (Mass.) Gas Company, is no longer a bachelor, having persuaded Miss Margaret A. Owens, of Derry Depot, N. H., to assume his name over a week ago.

MR. ALLEN SHEWMON, formerly Secretary of the Belle City Street Railway Company, of Racine, Wis., has been appointed Manager of the Green Bay and Fort Howard Gas and Electric Light Company, of Green Bay, Wis.

AT the annual meeting of the shareholders of the Denver (Col.) Consolidated Gas Company the following officers were chosen: Directors, Messrs. James B. Grant, George Coppell, Dennis Sullivan, Grant P. Schley, J. A. Thatcher, H. F. May, Joel F. Vail, H. M. Porter and C. A. Chisholm; President, James B. Grant; Vice-President, George Coppell; Secretary, Treasurer and General Manager, A. H. Branch; Assistant Secretary, Joseph A. Dale.

THE Spencer (Mass.) Gas Company is fitting up the Spencer Woollen Mills, so far as the card and spinning rooms are concerned, with Welsbach lamps.

WE regret to report the death of Mr. Joseph Andrews, President of the Racine (Wis.) Gas Light Company, whose demise occurred in Cincinnati, Ohio, about the middle of the current month. He was also President of the Oshkosh and Fon du Lac Gas Companies, and was widely known and respected in the northern part of Wisconsin, where he had large business interests. He was in his 57th year, and is survived by his wife, a son and two daughters.

THE new plant of the Burlington (Vt.) Gas Light Company has been completed and is in satisfactory working operation. Manager Parker is happy over the result.

THE meetings called by the four named Brooklyn (N. Y.) Companies "to vote upon a proposition for the sale and conveyance of all the property, rights and franchises of this Company," are to be held in accordance with this schedule: Williamsburgh Gas Light Company, in the office, No. 324 Bedford avenue, at 9 A.M., November 4th; Brooklyn Gas Light Company, No. 180 Remsen street, 12:30 P.M., November 4th; Nassau Gas Light Company, 191 St. James place, 5 o'clock, P.M., November 4th; Fulton Municipal Gas Company, 44 Court street, 12 o'clock, noon, November 4th.

THE St. Louis (Mo.) *Republic*, of October 18th, contains the following: The Laclede Gas Light Company has made a new scale of rates, going into effect January 1, reducing the price to 80 cents for heating and $1 for illuminating gas, and Secretary Ross of the Company thinks the new rate will decrease the consumption of coal for household purposes, thus aiding in solving the smoke problem. "It is not proper to say that the reduction is due to the growth of electric lighting," said Mr. Ross last night, speaking of the schedule which becomes effective Jan. 1, 1896. "The reduction is in the line of the policy of the Company. Last spring, when the rate for gas for heating purposes was reduced from $1.25 to $1 per 1,000 cubic feet, the announcement was made that it would very likely be the forerunner of a further reduction. On January 1 the price for heating purposes will be 80 cents per 1,000, and if sales

increase in the proportion that is hoped and expected, it is only a question of time when the new rate will be displaced by a lower figure. Our experience, and that of gas companies all over the world, is that reduction in rates means an increase of sales. Cost of production is diminishing from year to year, and the cost per 1,000 feet is less on a large than on a small quantity. These circumstances operate to lessen the price. The expansion of electric illumination is not the sole factor by any means." After January 1 the net price of illuminating gas in St. Louis will be $1 per 1,000 cubic feet, and for heating gas, obtained through a separate meter, 80 cents per 1,000 feet. The card rate is 10 cents per 1,000 higher on each, but this excess is rebated if bills are paid before the 10th of the month. It is learned that the question of revising the rate has been under consideration for some time, and it was the main item of business before the Board of Directors of the Laclede Company when that body met Tuesday. The reduction was then agreed to, practically speaking, but the matter was not finally settled until yesterday. The price of illuminating gas has remained stationary at $1.25 per 1,000 since 1890, in which year it was reduced from $1.50. Special efforts have been making by the Laclede Company for some time to extend its business in the way of furnishing gas for cooking and heating purposes, and this led to a reduction on this branch of the business last spring, when the price was cut from $1.25 to $1, while the illuminating schedule remained without change. "Cooking gas has come into general use in this city," said Mr. Ross, "and we are trying to make heating gas equally popular. We are prepared to demonstrate that it is cheaper than soft coal, even at the low price at which coal is sold in this city. The change will solve the smoke problem, which is giving so much trouble to the municipal authorities."

WE submit that Mr. C. J. R. Humphreys, President-elect of the American Gas Light Association, has fair grounds for a libel suit against the Philadelphia *Public Ledger*, of October 17th, because of the atrocious picture, purporting to be his photograph, printed therein.

THE Eastport Lighting Company has been incorporated at Calais, Me., for the avowed purpose "of making and distributing gas and electricity in the city of Eastport." It is capitalized in $50,000, and its officers are: President, W. A. Carey, of Malden, Mass.; Treasurer, W. H. Whitney. The certificate of incorporation was approved on the 9th inst.

HERE is a color contrast, also a wage estimate, as between the value of white and shaded labor at Portsmouth, Va., for which we are indebted to Mr. R. F. Tibbals: "The contractors who are constructing the sewerage system at Portsmouth, Va., are working 600 men, nearly all of which (*sic*) are negroes, at 90 cents a day. The Portsmouth Gas Company is working 30 men on its street main extensions. All of them are white men, and they are paid $1.50 per day."

THE following is from the Louisville (Ky.) *Commercial:* "Judge Toney, in the Law and Equity division, on the 14th inst., handed down a lengthy opinion in the case of Kaufman, Straus & Co., and various insurance companies, against the Louisville Gas Company, a judgment being given against the defendant Company in the sum of $233,055.33. The suit is the result of a boiler explosion that occurred in the plant of the Louisville Electric Light Company, October 26, 1891, in which the dry goods establishment of Kaufman, Straus & Co. was burned to the ground. Kaufman, Straus & Co., who were paid $195,000 by the insurance companies, joined with the insurance companies in entering suit against the Louisville Electric Light Company for $242,557.72, Kaufman, Straus & Co. claiming $41,081.48 damages as excess over the amount they received as insurance. The Louisville Electric Light Company and the Louisville Gas Company combined, and they became one and the same defendant. The announcement that a decision would be rendered attracted a large crowd, the larger part of which was made up of attorneys and insurance men. The first point decided was that the Louisville Gas Company is responsible for the Louisville Electric Light Company, having absorbed that corporation. Judge Toney then proceeded to go into the details of the explosion, handling them from testimony given by experts. He held that the explosion was not due to a faulty construction of the boiler, and that it was not the result of an excessive steam pressure, but that it was caused by the low water in the boiler, holding that it was gross negligence in the defendants' employees in not knowing that the water was too low. Judge Toney then read the entire petition, in which claim is made for $242,557.72, in eight separate paragraphs. He passed on them one at a time. The court held that the claim for $212,481.61, the value of the goods, is just, and awarded judgment in that sum. On the claim of $12,000 for the destruction of store fixtures, $10,000 was allowed. The rent of the place the firm was forced to occupy till the erection of a new building was $2,649.61, and judgment was awarded the plaintiffs in that sum. A $1,200 claim was allowed for the payment of the contractor for completing the building within a specified time; $3,259.75 was allowed for the payment of salaries while employees were out of business, as profits were allowed for that time and pay to employees was calculated on that. A $1,500 claim was allowed on goods that had been sold and burned, and the price of which had been refunded; $1,300 was allowed for the destruction of the day's credit slips; $300 was allowed for the amount in the cash drawer, and $7,297 for the loss of profits while the firm was out of business. In summing up his decision, Judge Toney instructed the attorneys to prepare a judgment for $233,055.33 in favor of Kaufman, Straus & Co., and gave the 37 insurance companies judgment out of that sum equal to the amount they paid Kaufman, Straus & Co., as a result of the fire. The case will be taken to the Court of Appeals."

TO-NIGHT the Light Committee of the town of Hackensack, N. J., will open proposals for the public lighting of that place, by means of gas or electricity, or both, for a term of one or three years.

THE franchise granted to Geo. M. Myers, of Kansas City, Mo., to supply gas to the residents of Kansas City, Kas., at the uniform rate of $1 per 1,000 cubic feet, has been forfeited through the failure of the grantee to file a written acceptance of the same, and to furnish therewith a guarantee bond of $10,000 within 30 days from the passage of the ordinance. The time limit expired on the 5th inst.

MR. SAMUEL MORRIS, of Troy, N. Y., seems to take it for granted that he is to succeed Anthony Clinchy as the Chief Gas Meter Inspector for the State. The last Legislature very accommodatingly amended the law applicable to the case, in that it now reads that the Chief Inspector (he has three deputies) may reside elsewhere than in New York city. Heretofore such condition as to residence was *sine qua non*.

Low Temperature Lights.

In a communication to *Comptes Rendus*, Professor Witz descants upon the economical aspect of lighting by phosphorescence—or, as he terms it, luminescence. He observes that luminous foci are constituted by an incandescent solid or fluid, the temperature of which, according to Draper, must exceed 1,100° C., in order that the light may be white and the spectrum complete. The visible radiation is bounded between the wave lengths 0.38 and 0.76 μ. But the infra-red extends, so to speak, indefinitely towards the less refrangible radiations, giving out heat sensible by the bolometer as far as to wave lengths of 30 μ, and consequently including more than five octaves of luminous radiations. If the curve of energy of the spectrum is traced, it will be found to present a single maximum, situated generally at the beginning of the infra-red; and the greater part of the energy will be found on the side of the dark or heat spectrum. It is therefore regarded as waste, so far as the production of light is concerned. The heat values attached to the foci of light are very small; and to improve the lighting effect of the energy that goes to the whole spectrum would be an important gain. It has appeared to some that the solution of the problem might be furnished by luminescent foci, in which the temperature of the rarefied gas that yields the effect of light is only, according to Warburg, between 21° and 132° C. These foci, it must be admitted, yield but little light. But, on the other hand, the thermic emission is still more feeble. The luminescence of the tubes is effected either by high tension currents, or by a frictional machine.

Professor Witz has experimented with several tubes, and especially with a lamp intended for miners. The latter is illuminated without difficulty by the induction current of a small Ruhmkorff coil. It yields enough light to read a table of logarithms at a distance of 40 centimeters from the source of light. Mr. Langley has been content with this very rudimentary photometric measurement, as the grayish blue tint of the light does not lend itself to ordinary photometric methods. The energy consumed is large in proportion to the light produced. The lamp was found to absorb more energy, and give less light, than an ordinary incandescent electric light. Still, the quantity of heat radiated is slight. Another form of lamp, intended for medical use, gave in heat only one-fifth part of the energy expended. From this point of view, no other light gives so favorable a result. It is hoped that improvements in this method of lighting will be possible, but the practical results up to the present are mediocre.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

EDITOR—Jos. R. Thomas, C.E.
ASST. EDITOR—T. J. Cunningham.
MANAGER—C. E. Sanderson.

MONDAY, OCTOBER 28, 1895.

The New Siphon Wagon.

[Air, "The Old Bowery Pit." Composed by by Mike Shay and Dedicated to the Brooklyn Gas Light Company.]

After many long years, oh, the old siphon cart,
At last we have bid it adieu.
'Twas fast growing ancient and falling apart,
And the springs they were all rusty, too.
We have made many trips on that cart, pumping drips,
But now we have laid it away.
So I'd have you to know that the B. G. L. Co.
Got a new siphon wagon for Shay.

Chorus.

'Tis a tank on four wheels, oh how different it feels
When riding o'er rough cobblestones;
Sure it won't break your heart, like the old siphon cart;
'Tis a Godsend to Pat and Mike's bones.

In New York the new siphon wagon was made—
'Tis painted in colors so bright—
'Twill run smooth and easy on up or down grade,
And will fit the car tracks snug and tight;
There's a nice covered seat to protect us from heat
Or the cold winter's wind, rain or snow.
Paddy Fitch will feel gay when out riding with Shay
On the new siphon wagon, oh! ho!—Chorus.

There's a place for our tools and the rotary pump;
Near the end of the tank's a new cock
To let out the water when we go to dump,
Way down at the old gas house dock;
Our new rig surpasses the Fulton's or Nassau's—
The trolleys must now clear the way
When bold Paddy Fitch, with his faithful bay horse,
Goes pumping gas drips with Mike Shay.
Chorus.

Aloysius Mike Keenan, whose bones are quite stiff
From riding upon the old cart,
Can now ride with ease on a soft cushioned seat
Without danger of breaking his heart.
Many thanks do we owe to the B. G. L. Co.
For our new siphon wagon, hooray!
Since he left Buenos Ayres Mike can now put on airs
When out pumping gas drips with Shay.
Chorus.

An Improved Dash Pot.

In vacuum dash pots as usually constructed for Corliss engines the air retained in the passage leading to the relief valve tends to prevent the proper closing of the vacuum cylinder. A new dash pot, designed by Richard H. Rice, of Providence, R. I., and owned by the Rice & Sargent Engine Company, has a relief valve of such form as to reduce the space occupied by the air passage to a minimum, with a large area exposed to the action of the confined air. The relief valve has a passage of small diameter communicating with the interior of the vacuum cylinder, and a large area for the action of the confined air to raise the relief valve from its seat, and a greater area exposed to the confined air when the valve is raised. The outer flanged part of the moving cylinder of the dash pot forms an annular piston, which fits the outer cylinder and serves upon the upward movement to draw the air for cushioning up from under the flap valves into the chamber of the outer cylinder, the air so drawn in at the upper movement being upon the downward movement first expelled rapidly through an opening in the side of the cylinder into the air passage until the face of the annulus piston passes the opening, the piston then being cushioned to slower downward movement by the slow escape of air through the valve opening. Thus the movement of the cylinder and its attachment is checked.

To secure proper action of the dash pot it is necessary to produce as perfect a vacuum as possible between the face of the plunger and the abutting face of the vacuum cylinder, and this is accomplished by forcing out the small quantity of air which leaks inward around the plunger at every stroke of the cylinder of the dash pot, which air would otherwise accumulate in the space between the face of the plunger and the head of the cylinder, thus diminishing the available pressure on the cylinder. To effect the proper active closing of the steam valve, and in order to expel the air leaking inward at each stroke of the vacuum cylinder, there is a valve seat bushing screwed into the side of the vacuum cylinder, so that the central passage of the relief valve held in the bushing will lie in the plane of the face of the head of the vacuum cylinder that the air inclosed between the abutting surfaces may escape out from the vacuum cylinder under the valve.

In order to provide a relief valve which will act under a light internal pressure of the air at the extreme closing movement of the vacuum cylinder, the bushing has a backward miter which forms an annular valve seat, and the valve has a stem fitting the opening in the bushing, the stem having a central air passage, at the outer end of which are two lateral openings, through which air can pass to the extended narrow annular space between the inner face of the valve and the outer face of the bushing, and by this means the required extended area for raising the valve may be obtained, with an air space reduced to its minimum. The face of the relief valve has an annular flange beveled reversely at its inner side to fit the backwardly beveled annular valve seat formed at the outer edge of the bushing, and the relief valve is held to its seat by a flat spring screwed to the side of the cylinder.

When the valve is thrown open by the pressure of the contained air in the vacuum cylinder, at the extreme closing movement on the vacuum plunger, the elevated valve presents a greater area for the pressure of the air than when closed, the area of a variable part of the reversely beveled annular surface being in this case effectively added to that of the inner surface, thus allowing the valve to remain open until the pressure within the air passage has become considerably less than that required to cause the initial raising of the valve.

In another form of the dash pot the valve stem has two small grooves on its outer surface instead of the central air passage, the required communication being thus formed with the narrow annular space between the inner face of the valve and the outer face of the bushing. The operation is the same as in the valve described.

The Market for Gas Securities.

Consolidated was exceptionally active during the week, several thousand shares having been traded in. The stock was strong, coming in at the opening to-day (Friday) at 148½. The maximum price to noon was 148¾. Consolidated is a purchase up to a 5 per cent. basis. Other city shares are strong and higher. The first positive move in the Brooklyn combination has been made, the shareholders of the Nassau, Fulton-Municipal, Williamsburgh, Brooklyn and Metropolitan Companies having received notice of a special meeting, to be held on the 4th prox., at which is to be considered a proposition to sell their plants, franchises and all else to parties who will then be named. The whole thing is arranged for.

Chicago gas is a bit weaker, but reorganization on a legal basis there is also assured. Consolidated, of Baltimore, is 66½ bid. The Consumers Gas Company, of Jersey City, N.J., has declared a semi-annual dividend of $3 per share, payable November 1st. Transfer books close to day to reopen November 2d. Western gas is firm and will go higher. Bay State gas is weak, and Mr. Addicks is said to have commenced active corralling operations at Buffalo, N. Y. It looks that the Gas Light Company, of Syracuse, has been secured by an Albany syndicate, headed by Mr. Pruyn, of Albany. The price is said to have been somewhat in excess of $1,000,000 for the $750,000 of the stock of the Company which has been issued.

Gas Stocks.

Quotations by Close & Nash, Brokers and Dealers in Gas Stocks.

35 WALL ST., NEW YORK CITY.

OCTOBER 28.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$55,430,000	100	148¾	149
Central	500,000	50	150	..
" Scrip	220,000	..	100	..
Equitable	4,000,000	100	199	..
Bonds, 6's	1,000,000	1,000	106	..
" 1st Con. 5's	2,300,000	1,000	115	..
Metropolitan Bonds	638,000	..	108	112
Mutual	3,500,000	100	185	..
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	..	..	
Northern	150,000	50	79	80½
" Bonds	150,000	1,000	..	98
New York and East River	5,000,000	100	33¼	34¼
Preferred	2,000,000	100	58¾	60½
Bonds 1st 5's	3,500,000	1,000	99½	..
" 1st Con. 5's	1,500,000	..	84	85½
Richmond Co., S. I.	848,650	50	50	..
" Bonds	100,000	1,000	..	..
Standard	5,000,000	100	68½	70
Preferred	5,000,000	100	108	..
Bonds, 1st Mortgage, 5's	1,500,000	1,000	109½	..
Yonkers	299,650	50	112	..
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	135	..
Citizens	1,200,000	20	65	..
" S. F. Bonds	320,000	1,000	..	101
Equity	2,000,000	10	..	..
" Bonds	1,000,000	..	..	..
Fulton-Municipal	3,000,000	100	175	..
" Bonds	300,000	..	108	..
Peoples	1,000,000	10	90	.
" Bonds, 7's	368,000	..	100	..
" " 6's	94,000	..	98	100
Metropolitan	870,000	100	170	..
" Bonds, 5's	70,000	.	..	..
Nassau	1,000,000	25	225	..
" Ctfs.	700,000	1,000	99	100
Williamsburgh	1,000,000	50	210	..
" Bonds	1,000,000	.	107	110
Out-of-Town Companies.				
Bay State	5,000,000	50	23¼	23
" Income Bonds	2,000,000	1,000	27	30
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	81	82
2d " " "	3,000,000	1,000	56½	57
Buffalo Mutual	750,000	100	125	..
" Bonds	200,000	1,000	95	100

Central, San Francisco	2,000,000	..	95	..
Chicago Gas Co.	25,000,000	100	68⅜	68½
Chicago Gas Lt. & Coke Co. Guaranteed Gold Bonds.	7,650,000	1,000	94	94¼
Columbus	1,000,000	..	63	66
1st Mortgage	1,085,000	..	91	93
Consumers, Jersey City	2,000,000	100	95	..
" Bonds	600,000	1,000	103	.
Cincinnati G. & C. Co.	7,000,000	100	202¾	203
Consumers, Toronto	1,600,000	50	184½	187
Capital, Sacramento	.....	.	..	41
Consolidated, Baltimore	11,000,000	100	66¼	67
Mortgage, 6's	3,600,000	..	107	107½
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910.000	..	..	..
Consolidated, 1st 5's	1,490,000	..	..	..
Detroit	4,000,000	..	29½	30¼
" Con. Bonds	4,312,000	..	..	71
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Fort Wayne	2,000,000	..	79½	80¾
" Bonds	2,000,000	..	84	86
Hartford	750,000	25	130	135
Indianapolis	2,000,000	..	146	150
" Bonds, 6's	2,650,000	..	106	..
Jersey City	750,000	20	180	..
Lafayette Gas Co., Ind.	1,000,000	100	88	85
Bonds	1,000,000	1,000	87	89
Louisville	2,370,000	50	..	180
Laclede, St. Louis	7,500,000	100	25	25¼
Preferred	2,500,000	100	80	85
Bonds	9,034,400	1,000	97¼	97⅞
Little Falls, N. Y.	50,000	100	..	100
Bonds	25,000	..	..	100
Montreal, Canada	2,000,000	100	200	..
Newark, N. J., Gas Co.	1,000,000	..	75	.
Bonds, 6's	4,000,000	..	120	..
New Haven	1,000,000	25	225	..
Oakland, Cal.	2,000,000	..	46½	..
" Bonds	750,000	..	..	..
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	2,100,000	1,000	..	108
2d "	2,500,000	1,000	104	105
Syracuse, N. Y.	500.000	25	..	..
Washington, D. C.	2,000,000	20	250	..
Western, Milwaukee	4,000,000	100	69	70
Bonds, 5's	3,556,000	..	94	95
Wilmington, Del.	500,000	50	188	190
Peoples, Jersey City	500,000	50	..	175
Paterson, N. J.	.....	25	99	102
Rochester Gas & Elec. Co.	2,150,000	50	..	..
Preferred	2,150,000	50	88	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	70½	71
St. Paul Gas Light Co.	1,500,000	100	68	70
1st Mortgage, 6's	650,000	..	..	..
Extension, 6's	600,000	..	..	..
General Mortgage, 5's	2,400,000	..	88	90

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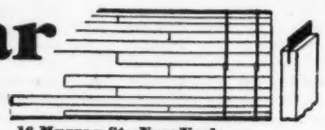

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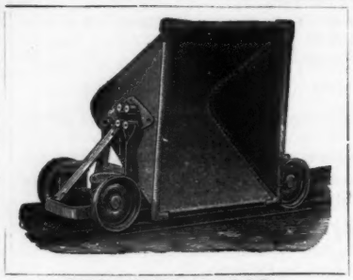

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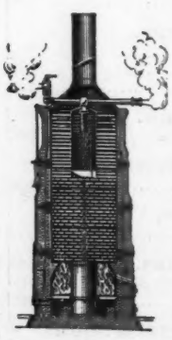

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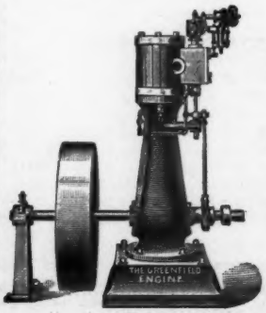

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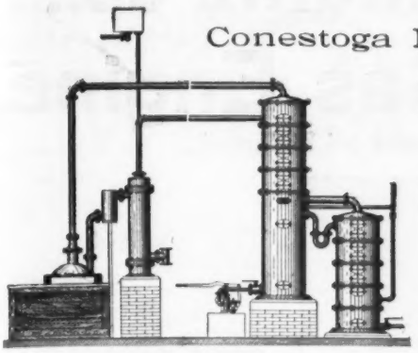

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Gas Works Machinery of all kinds,

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FELDMANN AMMONIA MACHINE,

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The Erection of Bi-Product Coke Ovens a Specialty.

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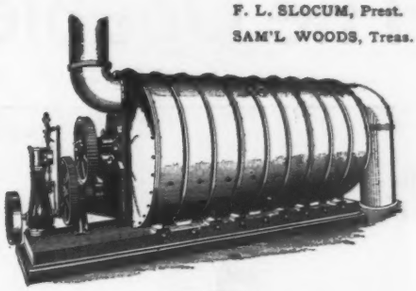

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Is Mined and Shipped from the Best Gas Coal Basin in Pennsylvania.

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GUARANTEED NOT TO STIFFEN. **Makers of All Kinds of Flexible Tubing.**

PATENTS

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SOLE IMPORTER OF THE CELEBRATED

German (Stettin-Didier) Clay Gas Retorts,

BLOCKS, TILES, FIREBRICKS, FIRE CEMENT,

Stettin "Anchor" & "Eagle" Brand Portland Cement

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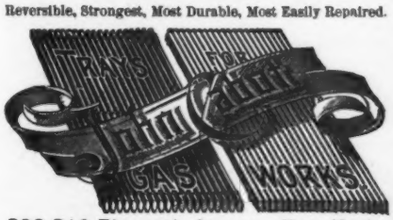
CHURCH'S TRAYS a Specialty.

Reversible, Strongest, Most Durable, Most Easily Repaired.



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We also make the Cheapest and Strongest

REVERSIBLE BOLTED TRAYS IN THE MARKET

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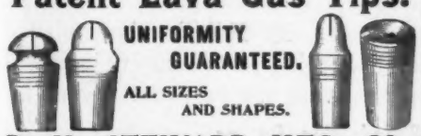

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TRIUMPH REGENERATIVE GAS HEATER

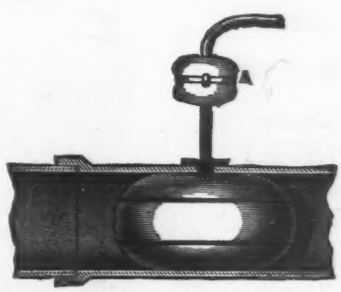
Wilder's Patents, Nov. 15 & 22, 1892.

Heats both air and gas before combustion. Gives high flame temperature and maximum economy, with entire freedom from smoke and smell. Radiates heat to the floor. Warms the feet and does not overheat the head. No headache and no colds caused by cold feet where this Heater is used. Has Group Governor, which regulates gas volumetrically proportionate to heat desired; the only correct regulation for stoves and furnaces. A gas heater, if a free gift, is still costly and extravagant if it burns gas wastefully. The Triumph Heater is constructed upon correct principles, and gives results not obtained with any other.

Write for descriptive circulars and order sample Heater.

WILDER MFG. CO., 816-822 Cherry St., Phila.

Peerless Patent Improved Gas Bag



These Gas Bags are used to stop the flow of gas while repairing or making alterations in gas mains. There have been numerous cases of workmen being badly injured, and sometimes fatally, by the escape of gas resulting from the bursting of a bag, and our patent improvement is designed to obviate such calamities. The indicator *A* shows unerringly when the bag has been sufficienty inflated to pack the main, and when the pumping should be stopped. Our Bags are made of a rubber stock especially prepared to admit of great distension, and to resist the action of Oils, Gases, Naphtha and other residuum in the mains, and they are made with lapped joints, which adds greatly to their strength.

3-in.	Gas Bag,	each,	$0.60	12-in.	Gas Bag,	each,	$5.00
4 "	"	"	.80	16 "	"	"	8.35
5 "	"	"	1.05	20 "	"	"	12.00
6 "	"	"	1.75	24 "	"	"	17.00
8 "	"	"	2.65	30 "	"	"	27.50
10 "	"	"	3.75				

The Peerless Rubber Mfg. Co.

16 Warren St., N. Y. City.

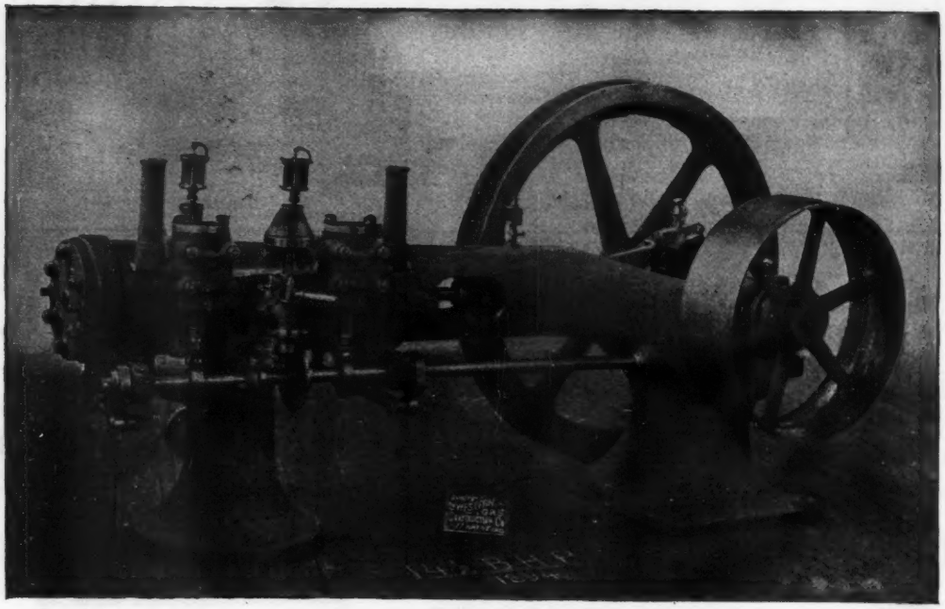
WM. W. GOODWIN, Prest. O. N. GULDLIN, V.-Prest. & Treas. H. B. GOODWIN, Sec. ERNEST F. LLOYD, Asst. Sec

THE AMERICAN GAS ENGINE CO.,

MANUFACTURERS OF

The Double-Acting Gas Engine,

Under the Patents of Griffin, and Dick, Kerr & Co., of London and Kilmarnock.



**

Single Cylinder.

Impulse Every Revolution.

(Two Strokes.)

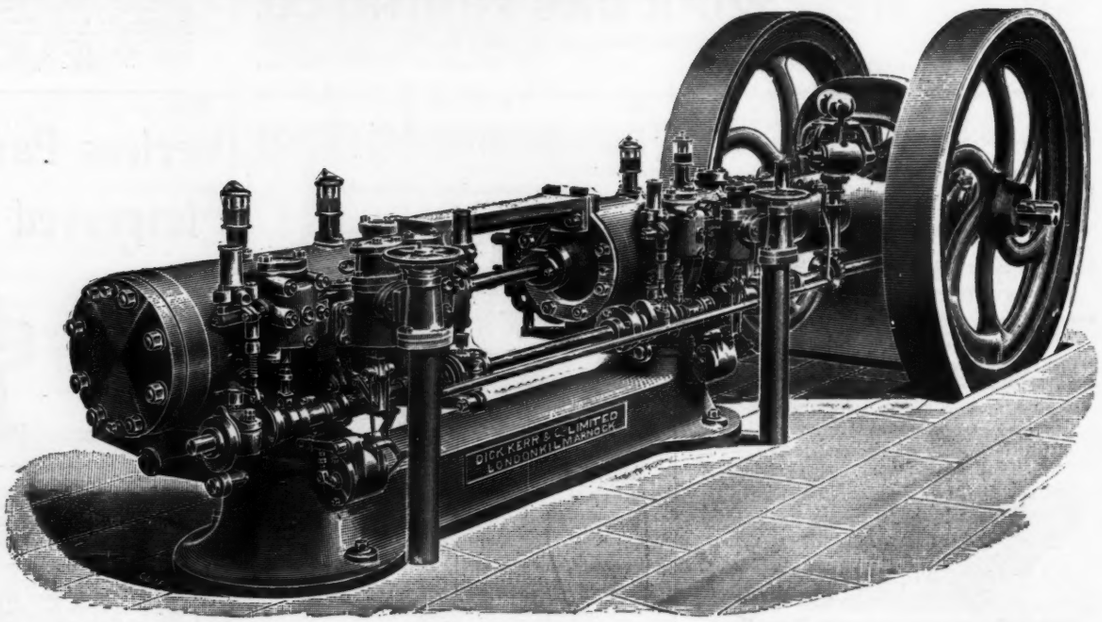
15 to 500 Horse Power.

For General Work and Isolated Electric Plants.

**

Tandem Cylinder. Impulse Every Stroke. 100 to 1,000 Horse Power.

For Central Stations and all work requiring extreme steadiness.



ESSENTIAL PRINCIPLE.—An impulse at each end of piston; using half force to each impulse; doubling the steadiness; reducing the wear on moving parts, and weight for given power. **CONSTRUCTION.**—The piston rod works through stuffing box in front end of cylinder, and connecting rod is carried in a cross-head working in a slide in frame, as in ordinary steam engine practice. All valves are of the poppet type, operated by cams on a single cam-shaft, giving positive movement to every working part. Tube or electric ignition. **RESULT.**—An engine of extreme simplicity and steadiness of action, the even wear on the cylinder and all working parts assuring increased economy, long life, and minimum cost in repairs. **RECORD.**—Successful and constant use in Great Britain for the past eight years. Address

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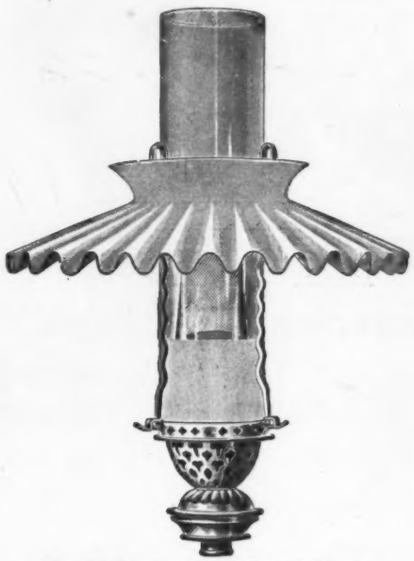
THE WESTERN GAS CONSTRUCTION CO. Bldrs. & Gen. Agts., Fort Wayne Ind.

The Improved

Welsbach Light.



No. 31 Burner, with No. 74 Shade.

No. 31 Burner, with Nos. 10 and 43 Shades.

Made by the

Welsbach Light Company,

Gloucester City, N. J.

Sole Manufacturers for the United States.

The WOLFF Gas Radiator.

Size, 33 Inches High, 21 Inches Wide and 10 Inches Deep. The Trilby Heaters are furnished in Brass, Copper-Bronze and Nickel Plate.

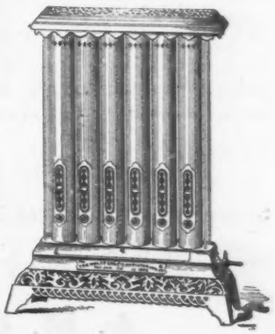
The Most Ornamental and Economical Gas Heater in the World.

The WOLFF Gas Radiators are no Longer an Experiment.

Heating with gas as a fuel instead of wood or coal was made practicable only four years ago, when the first WOLFF Gas Radiator was made. Since that time we have supplied Gas Radiators to heat all kinds of Rooms, Halls, Stores, Churches, Theaters, etc.; they are used in Bed Chambers, Sick Rooms, and wherever heat is required. And, because of their great success, several imitation Gas Radiators are offered, "said to be as good as Wolff's;" but none of them are as good. The WOLFF Radiator gives more and better quality of heat, at less cost, than any gas heater in the market.

In our Trilby Heater we again offer something **new, novel** and **good,** as well as beautiful and pleasing to the eye. Most Stoves, Heaters and Radiators in use heat the **top** of the room, leaving the **floor** cold (hence keep the head warm and the feet cold). Our Trilby Heater warms the floor first; then the heat rises gradually, warming the whole room comfortably, cold air being drawn in from the bottom (passing between the heated radiating flues) and thoroughly warmed before passing out at the top, while the gas, mixed with air, is burned in our "Patent Incandescent Iron Fires Burners," which greatly intensifies the heat, causing an extra amount of heat to be radiated, or thrown off onto the floor, while the products of combustion are carried up through radiating iron flues to the top of the Trilby Heater, and downwards and out through opening to flue or chimney pipe connection, making a current or outlet for burnt gas or impure air, thus causing perfect ventilation in the room.

The Trilby uses less gas and gives more and better heat than any other Gas Radiator in the market.



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THE WOLFF GAS RADIATOR MANUFACTURING CO.,

Office, 164 Franklin St., New York.

Bray's Patent "Enamel" Gas Burners.

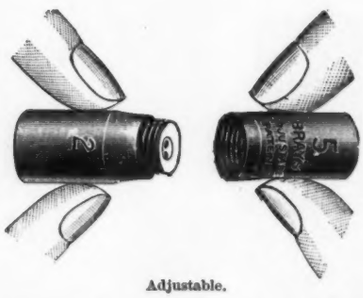
Bray's "Special" and "Adjustable" Burners

Are the Cheapest, Most Economical and Most Durable in existence, and will, at their REDUCED PRICE, save their cost in gas alone in forty hours' use.

Union Jet.

Slit Union.

Batswing.


Adjustable.

Made with Inside Screw to Suit American Fittings.

The "Specials" are made to Suit Low and High Pressures. The "Adjustables" consist of two Burners screwed together, the sizes of which can be arranged to suit any Pressure and Consumption. For full description see Catalogue.

See that **"Bray's Special"** or **"Bray's Adjustable"** is stamped on each kind of Burner.

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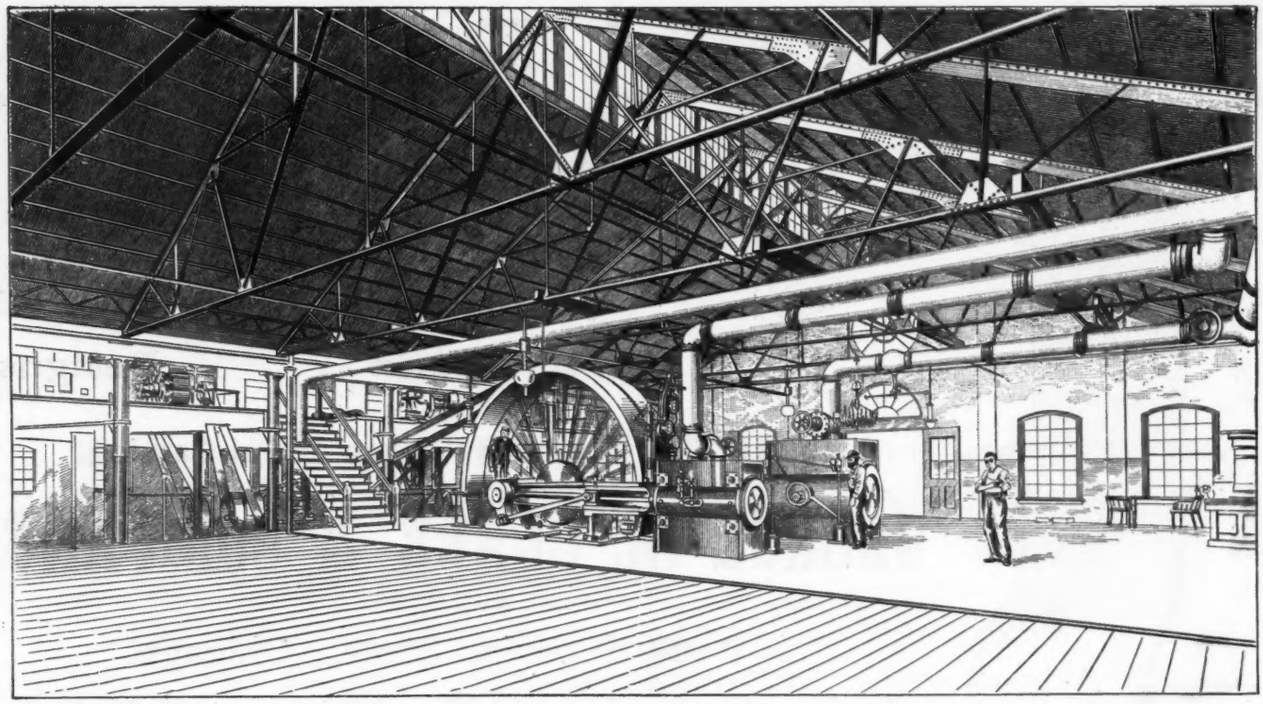

The above illustration is taken direct from a photograph, and shows an Iron Truss Roof designed and built by us for the Engine Room of the Pawtucket Gas Co., at Pawtucket, R. I. The roof trusses are of iron, with iron purlins covered with our Patent Anti-Condensation Corrugated Iron Roofing. This roofing is guaranteed not to drip in the coldest winter weather, and is the only known method of preventing drip from corrugated iron in cold weather.

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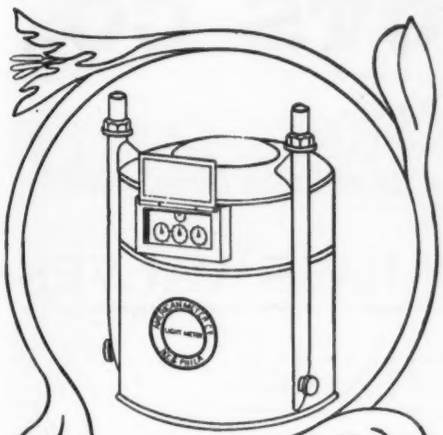

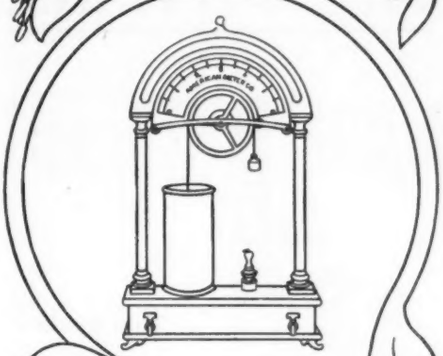

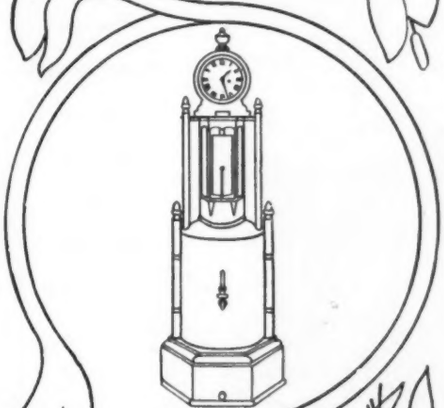

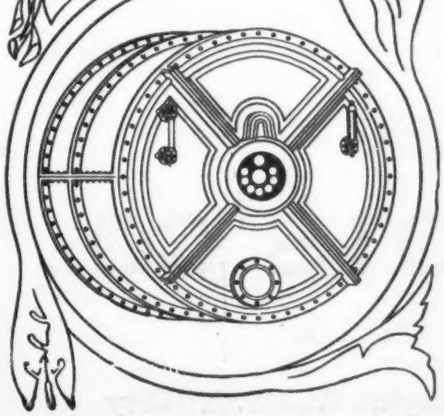

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NEW YORK AND PHILADELPHIA,

CHICAGO, ST LOUIS,

SAN FRANCISCO.

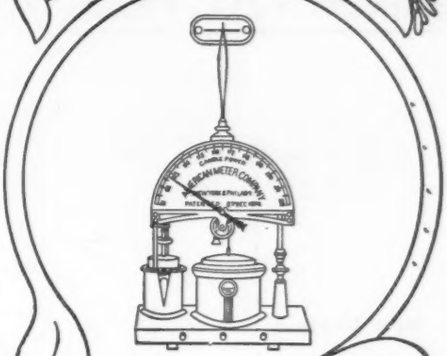
PUBLIC LIGHTING TABLE.

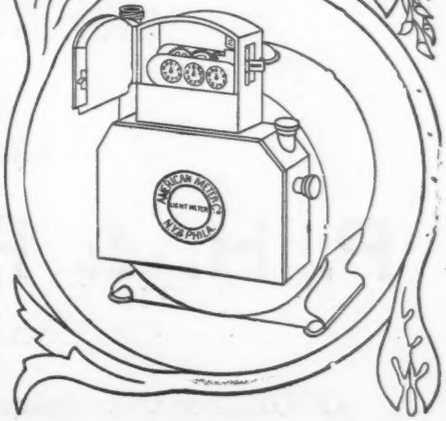
NOVEMBER, 1895.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Fri.	1	No L.	No L.	4.45	5.35
Sat.	2	No L. FM	No L.	4.45	5.35
Sun.	3	No L.	No L.	4.45	5.35
Mon.	4	5 20 PM	6.50 PM	4.45	5.35
Tue.	5	5.20	7.40	4.40	5.45
Wed.	6	5.20	8.40	4.40	5.45
Thu.	7	5.20	9 50	4.40	5.45
Fri.	8	5.20	11.00	4.40	5.45
Sat.	9	5.20 LQ	12.20 AM	4.40	5.45
Sun.	10	5.20	1.30	4.40	5.45
Mon.	11	5.20	2.50	4.40	5.45
Tue.	12	5.20	4.00	4.30	6.00
Wed.	13	5.20	5.50	4.30	6.00
Thu.	14	5.20	5.50	4.30	6.00
Fri.	15	5.20	5 50	4.30	6.00
Sat.	16	5.20 NM	5.50	4.30	6.00
Sun.	17	5.10	5.50	4.30	6.00
Mon.	18	5.10	5.50	4.30	6.00
Tue.	19	5.10	5.50	4.25	6.00
Wed.	20	5.10	5.50	4.25	6.00
Thu.	21	8.10	5.50	4.25	6.00
Fri.	22	9.10	5.50	4.25	6.00
Sat.	23	10.20 FQ	5.50	4.25	6.00
Sun.	24	11.20	6.00	4.25	6.00
Mon.	25	12.20 AM	6.00	4.25	6.00
Tue.	26	1.10	6.00	4.20	6.10
Wed.	27	2.20	6.00	4.20	6.10
Thu.	28	3.20	6.00	4.20	6.10
Fri.	29	4.30	6.00	4.20	6.10
Sat.	30	No L.	No L.	4.20	6.10

TOTAL HOURS LIGHTING DURING 1895.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	237.00	January	423.20
February	196.40	February	355.25
March	195.50	March	355.35
April	165.30	April	298.50
May	153.40	May	264.50
June	138.20	June	234.25
July	146 30	July	243.45
August	152.50	August	280.25
September	165.10	September	321.15
October	186.10	October	374.30
November	204.10	November	401.40
December	219.30	December	433.45
Total, yr.	2161.20	Total, yr.	3987.45





P. H. & F. M. ROOTS CO.,

Connersville, Ind.

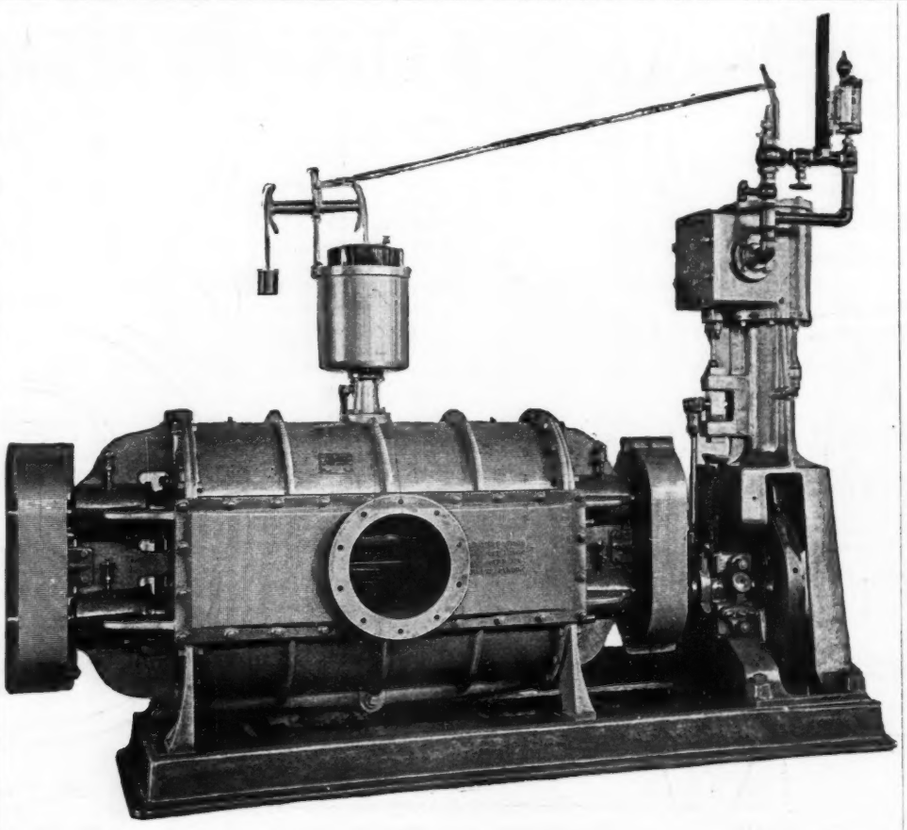
Exhausters with Combined Capacity of 65,000,000 Feet per Day Sold so far this Season.

GAS EXHAUSTERS. BYE-PASS VALVES.

AUTOMATIC GAS GOVERNORS.

GAS VALVES. PIPE FITTINGS.

New Design of Direct Connected Engine and Exhauster on Same Bedplate.



This Design is Used for all Exhausters from No. 7 to No. 10, Inclusive.

Write for Illustrated Catalogue.
Estimates submitted on application.

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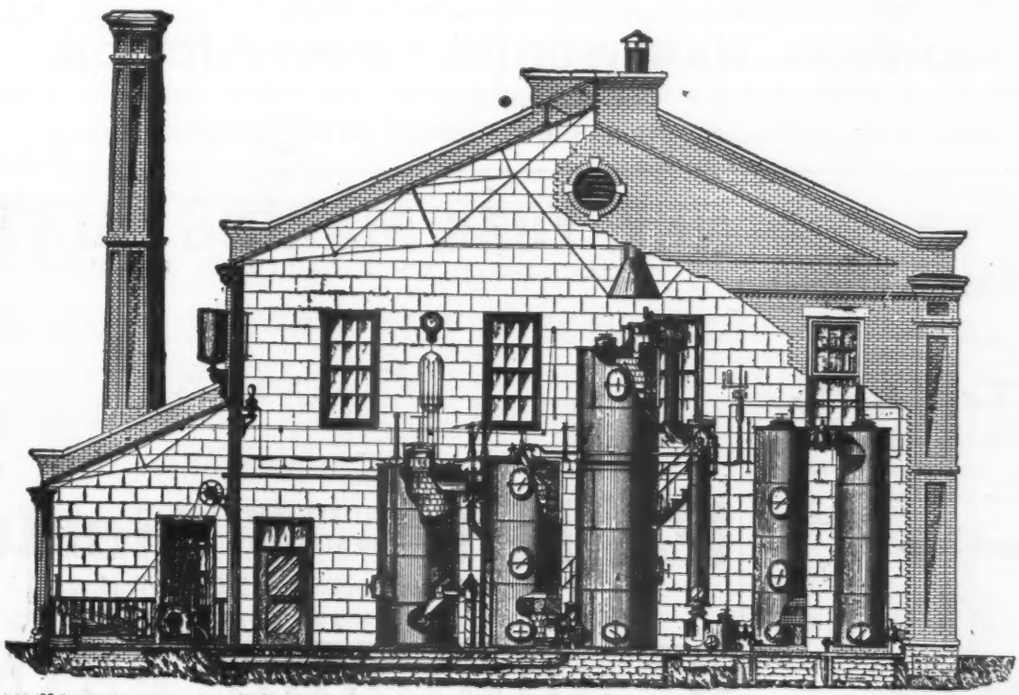

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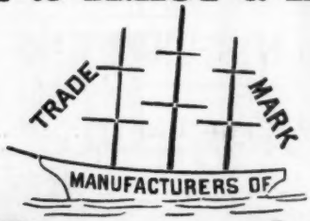

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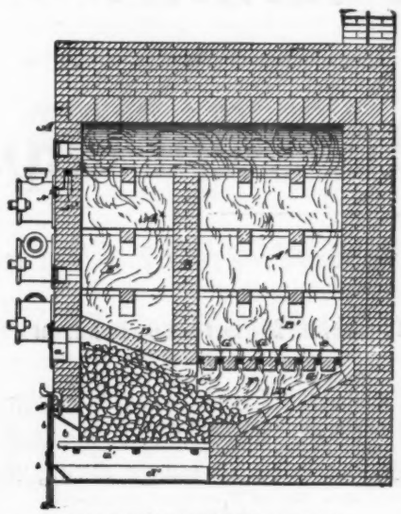

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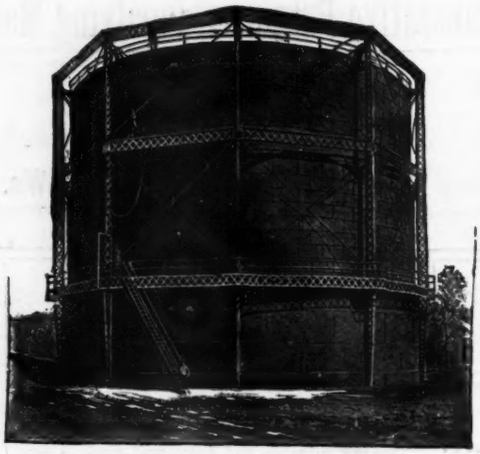

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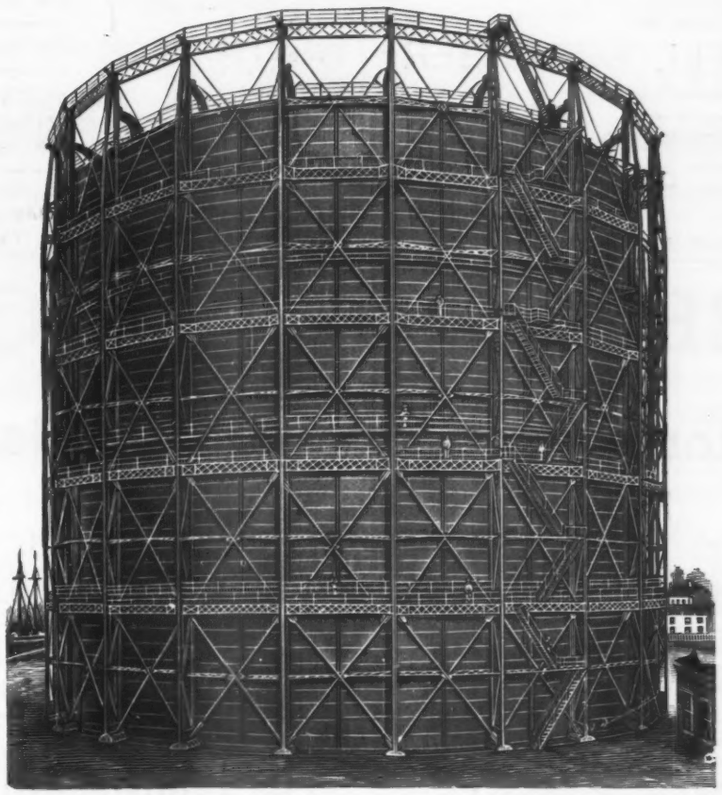

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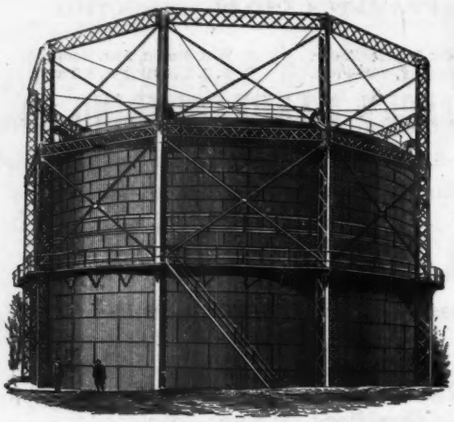

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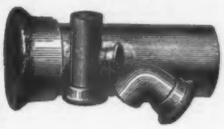

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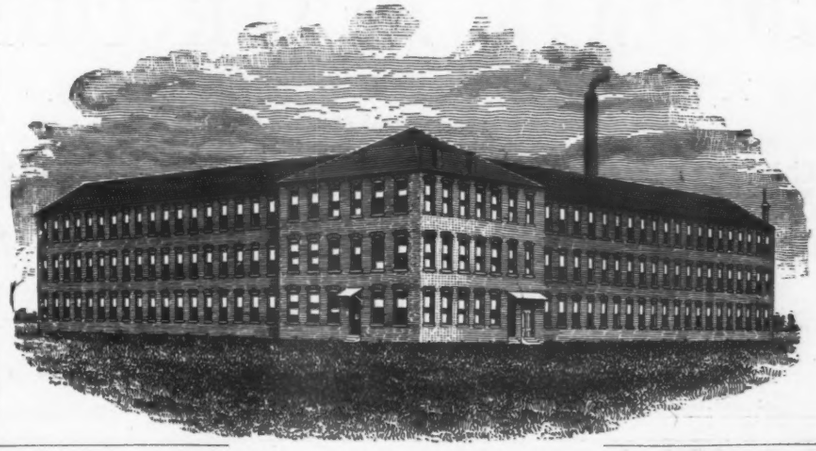

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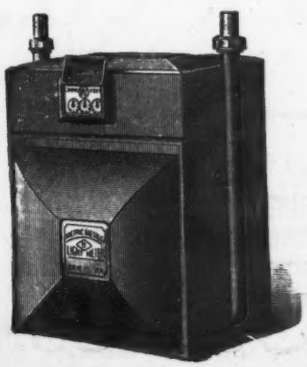

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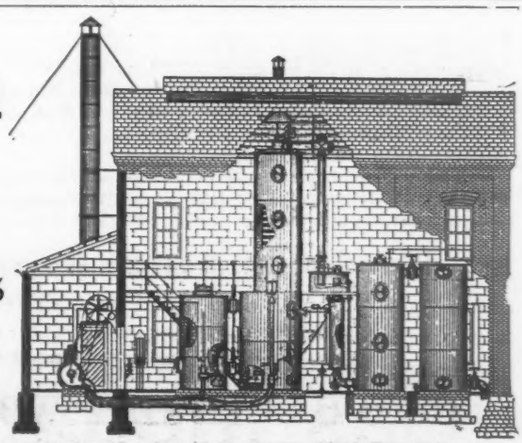

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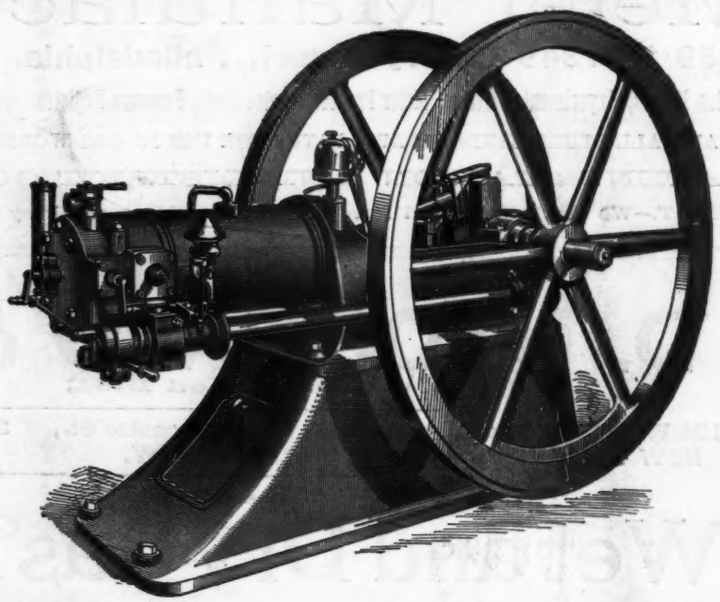

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